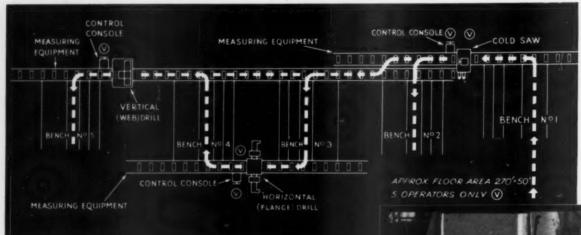
THE ARCHITECTURAL REVIEW VOLUME CXXVII NUMBER 757 MARCH 1960 FIVE SHILLINGS

Our new automatic fabrication plant

One of the largest of its kind in the world



This installation combines speed, accuracy and economy.

Allied with the immediate availability of comprehensive stocks of steel, this automation development enables us to quote even lower prices and to deliver even more quickly

Banister, Walton

build in steel

BANISTER, WALTON & CO. LTD.

Structural Engineers & Stockholders

MANCHESTER · LONDON · BIRMINGHAM



No. 53:71 "Sheerline" Combined Fitting

For over a century the name Shanks on sanitary fixtures has been synonymous with high quality of material and exellence of craftsmanship.

In homes great and small all over the world, on the ships of the seven seas, in hospitals and schools, in hotels and factories, Shanks' bathroom and other sanitary appliances contribute greatly to the civilised way of life.

For elegance of design and fitness for purpose specify Shanks' world famous sanitary fixtures.



AT A NEW FACTORY FOR J. S. FRY & SONS LTD., SOMERDALE

The photograph shows one of several 'Universal' columns, each carrying an estimated load of 1000 tons.

The steelwork of this factory, comprising 2,100 tons, was erected by us in $4\frac{1}{2}$ months.

General contractors: John Knox (Bristol) Ltd.

STEELWORK IS CHEAPER AND READILY AVAILABLE

STEELWORK BY REDPATH BROWN

Branches: Edinburgh, Glasgow, London and Manchester



For ALL-OVER heating....



- * PLEASING APPEARANCE—finished in white, its compact, neat body blends
 with any surroundings.
- ** NOISELESS quietly efficient designed to work in
- TROUBLE-FREE—the 'Kalorite'
 will operate for years without
 maintenance; no greasing or
 oiling, no glands to leak or maintain. No radio or T.V. Interference.
- * EASY TO INSTALL fitted directly into the pipeline, it needs no support, and is connected to the normal electric supply.
- * ECONOMIC electricity consumption is negligible.



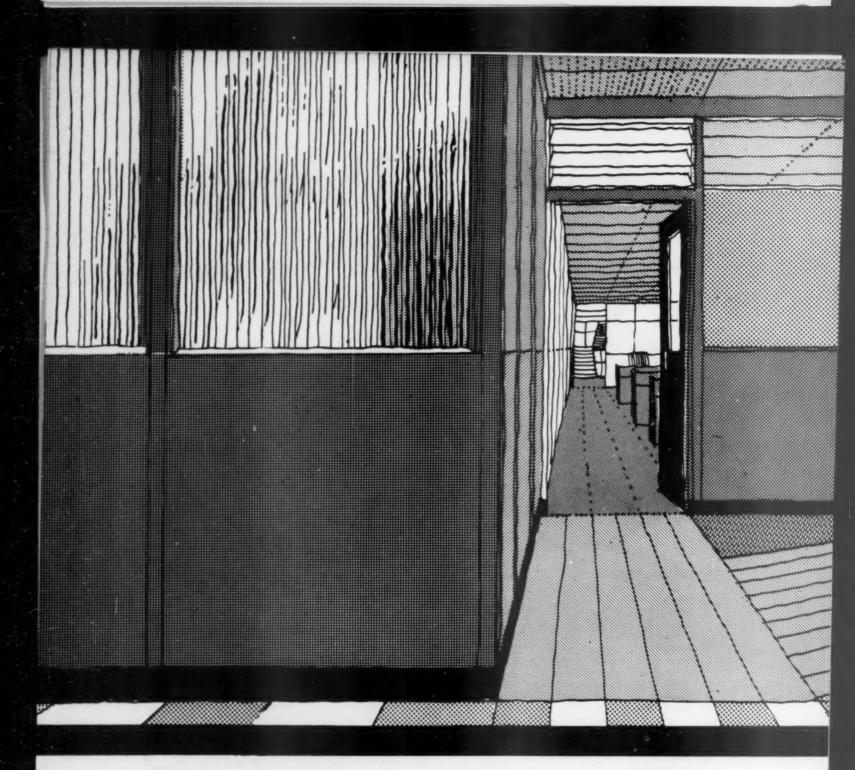
THE HARLAND ENGINEERING CO LTD

Kalorite Sales Department · HARLAND HOUSE · 20 PARK STREET · LONDON WI · Tel: GRO 1221

Branch Sales Offices: Bristol · Glasgow · Leeds · Newcastle · Nottingham · Timperley · Wolverhampton and Overseas

WORKS AT ALLOA. SCOTLAND & TIMPERLEY. CHESHIRE

KI



opening up better ways of closing in! Roneo flushing modular partitioning



A great range of panel and door units with heights from 7' to 10' 8". Provision for on-site adjustments.



Extreme flexibility that gives a new freedom to architects in planning partitioning



Heater Panels that are controlled for efficient, trouble-free heating.



Roneo Flushline Modular Partitioning gives architects and planners new opportunities not hitherto available in this country. Gone are the limitations of sizes, finishes and fittings previously associated with steel partitioning, however good.

Gone are the restrictions of rigid style and decorations.

Here instead, is a new freedom of opportunity to plan, design, use new materials and to execute partitioning schemes in a far better aesthetic,

economical and practical manner than has ever before been possible.

Write for full information to: RONEO LTD · 17 SOUTHAMPTON ROW · LONDON · WC1
BRANCHES AND AGENTS THROUGHOUT THE WORLD



High and low level ventilation through centrally pivoted glass vanes at top and through skirting at base.



Single or double glazing, vista windows and clerestory glazing too.



Special panel materials and a choice of colours offer new possibilities for modern, attractive decor.



Norwich Union Insurance Societies

Norwich Union House, 8-12 South Parade, Nottingham

Architects: Evans, Cartwright & Woollatt, F/F.R.I.B.A.

H & C

ELECTRIC PASSENGER & GOODS

LIFTS



HAMMOND & CHAMPNESS LTD Gnome House, Blackhorse Lane Walthamstow, London E.17 Telephone: LARkswood 1071





by taking advantage of the new provisions of BS-499 (1959), worthwhile economies can be effected. Better build with Booth Steelwork and cut the cost of *your* structure.

JOHN BOOTH & SONS (BOLTON) LTD. HULTON STEELWORKS, BOLTON.
Telephone BOLTON 1195

London: 26 VICTORIA STREET, WESTMINSTER, S.W.1.

Telephone ABBey 7162



Behind every Wandsworth switch lies 50 years of electrical experience!



THE "WEMPRESS" SWITCH is operated by a metal rocker instead of the conventional dolly, to give control by a press—even by shoulder or elbow. Supplied with brass or aluminium front plates in a wide range of finishes: flush or surface mounting.

Since 1905 the name "Wandsworth" has meant all that is best in electrical accessories. Now, over 50 years since the first firm foundations were laid, the finish and quality of all "Wandsworth" products is still the finest obtainable. The range is all embracing—if your problem is of hospital, school or stately home our catalogues will assist you.



MANUFACTURERS OF ELECTRICAL ACCESSORIES

STAND E.12
A.S.E.E. EXHIBITION APRIL 5th-9th
EARL'S COURT.

Please write or telephone for catalogues to Dept. AR4
WANDSWORTH ELECTRICAL MANUFACTURING CO. LTD.,
Albert Drive, Sheerwater, Woking. Tel: Woking 3506



THE "RINGWAY" SWITCH is tamper-proof—as cover plate can only be removed by a special key. Superior quality for use in public buildings, schools, hospitals, etc. Many metal finishes available.

No more than once or twice in a decade

does an event of this stature

occur in the field of interior design.

As the 1960's open, Humasco Limited

proudly announce







AMTICO

probably the most beautiful flooring the world has ever known

Amtico is solid vinyl. Five important words sum up the tremendous advantages of solid (or homogeneous) vinyl over ordinary (or combination) vinyl. Colour. Design. Translucency. Resilience. Wear. The most subtle or brilliant colours. arranged in the most arresting design. may be used in Amtico flooring. Its soft translucency, never before achieved in interior design, comes from Amtico's high proportion of basic vinyl resin to other ingredients. Its natural resilience gives unsurpassed comfort under foot, and means that Amtico is quieter than flooring which does not 'give'. And because it is resilient, Amtico will not crack, splinter or break down. This solid flooring in use for over 12 years in America shows no signs of wear. In addition to these unique features, Amtico also offers, of course, vinyl's well-known advantages of easy maintenance, hygiene and safety. Amtico is introduced in a limitless range of colours and patterns. Plain. Marble. Terrazzo. Renaissance. Wood grain. Cork. Eldorado Metal. Stardust. And special designs that repeat elements or whole patterns from curtains, murals or other decorative features. This offers vast scope to the architect and designer for creating original floor - and wall - coverings. Stocks are held by Humasco, who also offer a technical and design service. It is quite impossible to show, within the limitations of print reproduction, how beautiful Amtico flooring is. Please see it. You are invited to the Amtico Display, where many varied floors have been laid and can be seen, at Humasco's new showrooms, designed by Paul MacAlister of New York (former President of the American Institute of Designers) who has been over here to supervise the work. You may care to ring CITy 1056, or write to the address below, suggesting when you can be expected.

HUMASCO LIMITED · VINYL COVERINGS · 23 OLD BAILEY · LONDON · EC4



Flexible Doors

by the people who pioneered them



Vision Panels on the light doors are supplied with 4" Perspex and 1 " Perspex on the heavy doors.

fitted with a fully adjustable patented double action return spring, concealed in the top of the tubular steel door frame. The door pivots on a hardened cone bearing let into the floor.

Heavy Rubber Doors are fitted with adjustable door springs top and bottom of each leaf.

The Duniop Panels are specially manufactured and are reinforced with cotton duck. In the light door 42 oz. 2-ply and 42 oz. 4-ply in the heavy door.

All doors can be fitted with additional vision panels if required. Jamb brackets can be supplied for both light and heavy doors where the floor cannot be cut or if there is no head. Neway doors are truly flexible they can be tailored to fit most openings.

DUNLOP make the Rubber Panels.



FLEXIBLE RUBBER DOORS

See Neway Flexible Doors at the Building Centre, 26 Store Street, London, W.C.1. or write for free leaflet to the Manufacturers. Architects are invited to apply for Specification Sheets.

WILLIAM NEWMAN & SONS LTD. (Dept. AR2), HOSPITAL STREET, BIRMINGHAM 19



STEEL GIVES STRENGTH

Colvilles have built up a reputation as suppliers of all types of Structural Steel - Light and Heavy Sections, Joists and Plates - to all specifications.

If a welded structure is involved - then specify DUCOL W.30, a high strength weldable steel which has a yield strength approximately twice that of ordinary mild steel.



COLVILLES LIMITED 195 West George St., Glasgow C.2.

Jonwindows Curtain Walling



Administration Block for the Mersey Division of the Bowater Organisation at Ellesmere Port. Architects: Farmer & Dark, F/F.R.I.B.A. Contractors: J. Gerrard and Sons Ltd.

JOHN WILLIAMS OF CARDIFF LTD

EAST MOORS ROAD · CARDIFF · Tel: CARDIFF 33622 (12 lines) Telex 49303



Y.M.C.A. Building Croydon. Architect: F. Starling. B.A. A.R.I.B.A.



STELRADS...

for the good Samaritan

WARMTH AND COMFORT is the special recipe served up by much appreciated Y.M.C.A. hostels all over the world.

Helping this, the newest branch at Croydon, to cope with the demand is yet another Stelrad installation...

Stelrads, Britain's original, unequalled steel radiators, have a capacity for making friends and being at home in any kind of surroundings, for there is a suitable design and size for every need.

Full details of these fine radiators, together with specifications and illustrations, are contained in the Stelrad brochure. Please post us a card for your copy.

STEEL RADIATORS

BRIDGE ROAD, SOUTHALL, MIDDLESEX

Telephone: SOUthall 2603

RILEY service in your area

Make a note of your local Riley service centre now and get to know our representative or agent. He will give full advice on the type of equipment required and will install and keep your Riley equipment at optimum operational efficiency. Comprehensive contract maintenance can be arranged where required.

LONDON

BELFAST

BIRMINGHAM

BRISTOL

DERBY

DUBLIN

GLASGOW

LEEDS

MANCHESTER

N. E. MIDLANDS

NEWCASTLE-UPON-TYNE

RILEY (IC) PRODUCTS LTD, 19 Woburn Place, W.C.1 Terminus 2622

HENRY R. AYTON LTD, 7 Brunswick Street Belfast 29834

POWER UTILITIES LTD, Lombard House, Gt. Charles Street Central 3446

RILEY (IC) PRODUCTS LTD, 75 Queens Road Bristol 27934

RILEY (IC) PRODUCTS LTD, Derby Derby 23223

HENRY R. AYTON LTD, 20 Harcourt Street Dublin 51335

RILEY (IC) PRODUCTS LTD, 129 St. Vincent Street Central 1164

RILEY (IC) PRODUCTS LTD, National Employers' House, Quebec Street Leeds 33274-5

BAKER, KELLY & WALLIS, 123 Deansgate Blackfriars 5122

RILEY (IC) PRODUCTS LTD, 54 Thorpe End, Melton Mowbray, Leicestershire Melton Mowbray 2495

RILEY (IC) PRODUCTS LTD, Emerson Chambers, Blackett Street Newcastle 24871

Representatives and service engineers are established at the various centres listed to give the best possible pre-sales, installation and maintenance service covering all the Company's equipment:

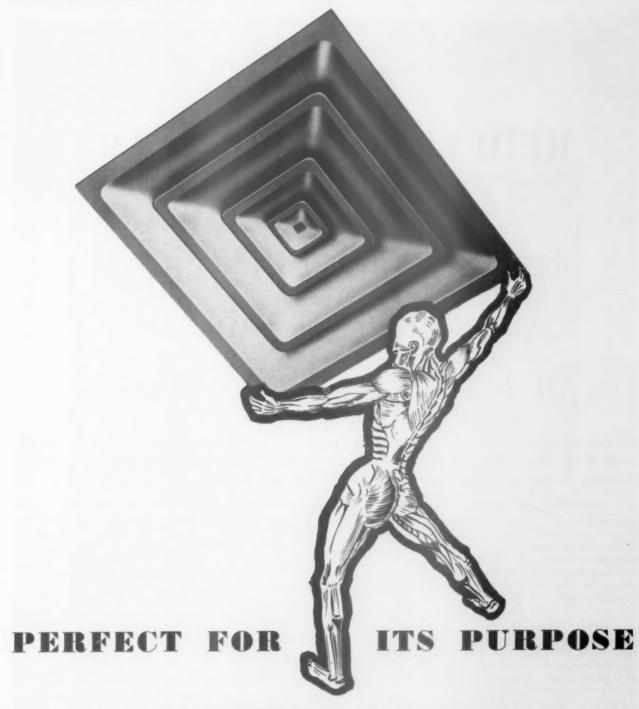
UNDERFEED & CHAIN GRATE STOKERS
OIL BURNERS & OIL FIRING INSTALLATIONS
OIL FIRED AIR HEATERS · KILN STOKERS · INCINERATORS
SYNTRON ELECTRIC VIBRATORY EQUIPMENT

RILEY (IC) PRODUCTS LIMITED

One of the International Combustion Group of Companies

NINETEEN WOBURN PLACE LONDON WC1 · TELEPHONE: TERMINUS 2622

TGA R74



As in the muscle system of the human body, each diffuser manufactured to Tuttle and Bailey design, is perfect for its purpose. For the first time designers have available an extensive range of diffusers in which induction rates, diffusion pattern and sound levels, are predictable. Have our Engineer discuss it with you.

POWELL DUFFRYN MODULAIR LTD.

SOLE LICENSEE FOR THE SALE IN THE U.K. OF TUTTLE & BAILEY MEDIUM PRESSURE AIR DISTRIBUTION EQUIPMENT



Powell Duffryn House, Berkeley Street, London W. I. Phone GROsvenor 5146

The new REDFYRE CENTRAMATIC

makes oil-fired central heating the natural choice for three or four bedroomed houses

Oil-fired central heating is to be found perfected today in the new Redfyre Centramatic. All the problems of convenience and economy have been solved in the most sensible way to provide trouble-free service that has never been possible until now. Read on and you will see . . .

"Kitchen Equipment" Design

The new Redfyre Centramatic is the only oil-fired boiler which matches up to the accepted measurements for basic kitchen equipment. It is fully insulated, finished in a wipe-clean three-tone enamel and is available in an attractive variety of popular kitchen colours.

Complete Thermostatic Control

The householder selects the temperature he needs on the temperature scale. Then the Redfyre Centramatic regulates the burning to keep the water automatically at the selected temperature.

Automatic Combustion

The Centramatic does not rely on chimney draught for efficient combustion, although it needs a chimney flue into which to exhaust. It provides its own draught, and regulates how much it needs. This saves a lot of fuss and bother.

Electric Ignition

Ordinary oil-fired boilers, when they are idling, cut down on the general rate of burning or rely on a simple pilot-light. Either way you get imperfect, uneconomical and "sooty" combustion. The Redfyre Centramatic has the perfect solution: when the thermostat control indicates "no heat required", the flames go out altogether and no oil or electricity is used. When heat is needed again, the oil is relit automatically and the unit is operating at maximum output within seconds.

Easy to Install and Service

The Redfyre Centramatic comes as a packaged unit. It requires no specialised installation technique. The local supplier can service it yearly, and that's all the attention it should need.

Further Facts

The Redfyre Centramatic can produce up to 50,000 B.T.U.s per hour—enough for radiators, plus heated towel rails, plus ample hot water for the kitchen, plus hot baths. In other words it is ideal for the three or four bedroomed house. A point to remember is that because the Centramatic has the benefit of electric ignition, it is still efficient and economical when worked at less than its full capacity.

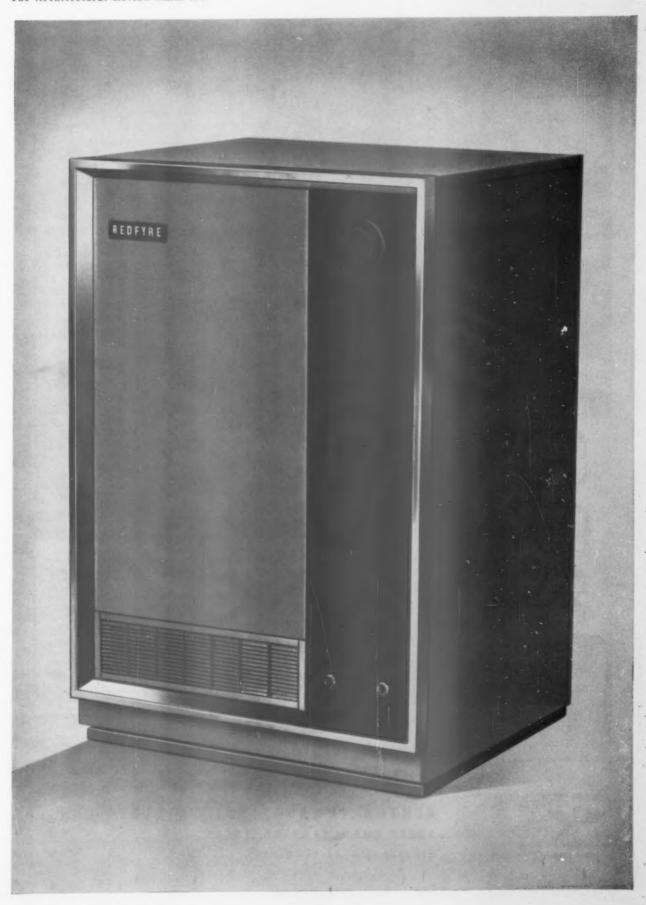
Two Sizes Available

There is also available a larger version, the Centramatic 80, with an hourly output of 80,000 B.T.U.s. It has all the good points of the Centramatic 50, is cylindrical in shape (22 ins. diameter by 54 ins. high) and compact for its output.

Centramatic 50 £128 Centramatic 80 £149

May we tell you more?

Full technical specifications of the Redfyre Centramatic oil-fired boilers are available. Please write to Newton Chambers & Co. Ltd., Redfyre Products, Thorncliffe, Sheffield.





FUNGICIDAL AND ANTI-BACTERIAL PAINT

NON-POISONOUS-HARMLESS,

ENT A

Ξ ER

NON-POISONOUS FUNGI-CHEK

the permanent, non-poisonous, harmless fungicidal and antibacterial paints. Now you can fulfil two objectives when decorating, provide a superlative finish AND a surface that is continuously fungicidal and anti-bacterial throughout the life of the paint AND AT NO EXTRA COST . . . because Fungi-chek is the same price as ordinary paints.

Fungi-chek (Gloss, Matt & Emulsion) Paints serve two purposes:

(1) they provide a decorative finish par excellence, with first class durability and resistance to steam, abrasion, acids and alkalis, etc.

(2) they are made continuously fungicidal and anti-bacterial by the Dentolite Process, and inhibit the growth of Mould, Fungi, Wild Yeasts and Bacteria -pathogenic or otherwise.

(Tests after 5 years show the materials to be still thoroughly effective).

Fungi-chek is entirely free from any toxic compounds of lead, arsenic, copper, mercury, tin or any harmful or poisonous chemicals, i.e. Fungi-chek is non-poisonous and harmless.



PROOF! From one of the many users throughout the world comes this convincing proof of Fungi-chek efficiency.

MINISTERE DE L'AGRICULTURE ECOLE NATIONALE, D'INDUSTRIE LAITIERE DE POLIGNY (JURA) 31 RUE LITTRE

We have carried out, in 1950, trials with paints on a wall panel in one of our

rooms where we manufacture soft pastes. A certain number of products have been applied on adjoining panels on the same day.

I have pleasure in sending you herewith a photograph which was taken approximately 8 months after application of the paints.

The Dentolite which you have sold us in the centre panel of the photograph. It is evident that this has behaved perfectly in comparison with the two competitive It is evident that the has contacted perfectly in competitive products on its left and its right, particularly as the little stains that show in the left hand bottom corner are accidental dirt marks.

Allow me to congratulate you on the quality of your product and I remain,

Le Directeur de l'Ecole

DENTON'S PAINTS



A Technical Advisory Panel is at your service and Scientific Literature and Samples are available on request.

DENTON EDWARDS PAINTS LTD. ABBEY ROAD, BARKING, ESSEX RIPpleway 3871 (10 lines)



SKIRTING HEATING BY CRANE

This handsome new building was designed for William Dibben & Sons Ltd., the well-known Southampton builders' merchants, to give maximum business efficiency. Steel constructed and faced with Old English bricks, it provides, under one roof, not only vast showrooms where Dibben's customers can inspect a wide range of equipment, but also storage space and office accommodation. In such a compact unit the heating system had to occupy a minimum of floor saces.

On the advice of the heating engineers, Crane Skirting Heating was installed, and the building is heated by 600 panels, 1200 ft. overall length, of Type RC 9-inch Radiant/Convector. Type R is also available in this 9-inch size, as well as the 6-inch size. Both types give comfortable all-over warmth and the space-saving that is so important in commercial buildings. Both are made in 2-foot and 1-foot lengths of cast iron and are very resistant to damage. In fact, for a modern building Crane Skirting Heating is the perfect answer.

Designed and installed by Arthur Scull & Son Ltd., Southampton. Architects: Gutteridge & Gutteridge, Southampton.



CRANE HEATING EQUIPMENT

CRANE LTD., 15-16 RED LION COURT, FLEET STREET, LONDON E.C.4 WORKS: 1PSWICH

Branches: Birmingham, Brentford, Bristol, Glasgow, Leeds, London, Manchester

Take a seat...

Tip-up auditorium seating is our business. Lecture theatre seating with writing ledge; tip-up chairs upholstered in foam rubber for permanent floor fixing; economical tip-up seating for assembly halls where the floor must occasionally be cleared.





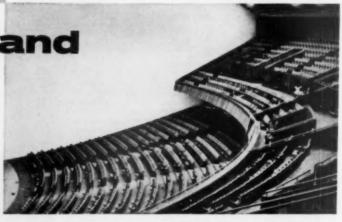
or two

or a thousand

All these and more make up our range. Plus all the help and advice, based on intimate knowledge of the subject and long association with architects and their problems, which we can give.

Have you seen our illustrated booklet?

A copy will be sent on request.





COX & CO. (WATFORD) LTD. · WATFORD BY-PASS · WATFORD · HERTS

Telephone: Watford 28541

ISN'T IT
NEARLY
LUNCH-TIME?

Well, you can't blame a frisky youngster for being bored with this business-letter dictation stuff—even if he is seated upon TRINASCOLIN—linoleum flooring at its modern best, supplied and laid by Limmer & Trinidad.

Craftsman-installed TRINASCOLIN produces a colourful and resilient floor which is easily maintained. It is available in several thicknesses and a variety of plain and marbled colours. The Limmer & Trinidad Group of Companies are specialists in all types of Decorative and Industrial flooring and have unique technical and practical experience to offer.

Descriptive leaflets are available on request.

THE LIMMER & TRINIDAD LAKE ASPHALT CO. LTD., Trinidad Lake House, 232/242, Vauxhall Bridge Road, London, S.W.1. Telephone: TATE Gallery 4388.

THE TRINIDAD LAKE ASPHALT CO. (NORTH WESTERN) LTD., India Buildings, Water Street, Liverpool 2. Central 8601.

THE WESTERN TRINIDAD LAKE ASPHALT CO. LTD., Asphalt House, St. Mary Street, Cardiff. Cardiff. 24781.

MEMBERS OF THE

LIMMER & TRINIDAD

GROUP OF COMPANIES

Doverite's bight...

for all contemporary rail fittings, handles, knobs, etc. Doverite is a colourful, noninflammable, plastic material for covering hand and stairway rails, door furniture, steering wheels, casement fittings, etc. It is comfortable to the touch and gives years of wear. The highly polished surface is permanent and cuts cleaning, decorating and maintenance costs. Also available in Black and White, of course.

Plastic covering for all hand & stairway railings, fittings, etc.



DOVER LTD., NORTHAMPTON.



Double Glazed

HOLCON LTD-21 MACKENZIE STREET SLOUGH BUCKS Phone Slough 25431 2 3

DOLPHIN HOUSE
SALISBURY · S. RHODESIA
Architects:
W. D'Arcy Cathart & Son



TOWN COUNCIL OF
CUREPIPE BUILDING - MAURITIUS
Architects:
Boulle-Lagesse & Schaub



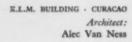
BRITISH COLUMBIA PROVINCIAL
GOVERNMENT OFFICES · VICTORIA
Architects:
Provincial Government
Architectural Department



SHELL BUILDING · LAGOS

Architects:

Walker, Harwood & Cranswick





POLICE HEADQUARTERS
HONG KONG
Architects:
P. W. D. Hong Kong

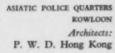




NGEE ANN KONGSI FLATS SINGAPORE Architect: Ng Keng Siang



ADMIRALTY FLATS
MOUNT AUSTIN · HONG KONG
Architects:
Palmer & Turner





ALEXANDRA HOUSE · HONG KONG

Architects:

Spence, Robinson & Partners



AFRICAN LIFE BUILDING
BULAWAYO · S. RHODESIA

Architects:
MacGillivray & Son



R.N.V.R. BUILDING · HONG KONG

Architects:
P. W. D. Hong Kong





WORKING CLASS FLATS
HONG KONG
Architects:
Chan & Lee



OFFICES FOR TRANSVAAL & CHAMBER OF MINES JOHANNESBURG Architects:
K. E. F. Gardiner & MacFabgden





FLATS FOR
SINGAPORE HARBOUR BOARD
Architects:
Swan & McLaren



Overseas outlook through...



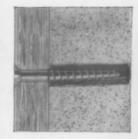
BANK OF CHINA SINGAPORE Architects: Palmer & Turner

CRITTALL WINDOWS

THE CRITTALL MANUFACTURING CO. LTD · BRAINTREE · ESSEX · BRANCHES & DEPOTS THROUGHOUT THE COUNTRY

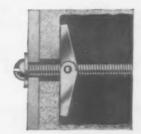


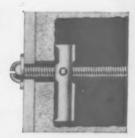
SOLID OR CAVITY MATERIALS

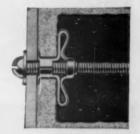












Rawlplug fixing devices save you time and money

SCREW

FIXINGS
Use the famous
RAWLPLUG for
neat, firm
Rxings in brick,
stone, etc. All
sizes for up to 2*
diameter Coach
Screus.
Rawlphys are
waterproofed and
unaffected by
climatic
conditions.



BOLT

For bolting down machines, light or heavy, use RAWLBOLTS. a dry fixing that grips by expansion. No cold chiselling, no waiting for cement to harden. Sizes up to 1" bolt diameter.





CAVITY FIXINGS The amazing RAWLNUT, screwed up from the front, forms its own rivet head behind the material—airtight, watertight, vibration-proof, squeak-proof! For all thin or hollow materials.

Fixing methods that served well enough in bygone days fall far short of modern standards of efficiency, when an average machine can be safely bolted down and in operation within an hour or so of arrival!

Rawlplug Fixing Devices always save time and therefore money, for it is a simple fact that on every screw and bolt fixing job, in solid or cavity materials, you'll make strong, absolutely safe fixings in far less time than by any other method.

You can easily prove this for yourself. The first step is to write for full details of the 21 different types of Rawlplug Fixing Devices. Write us now—and if after studying our literature, you have any difficulties about a particular problem, our Technical Service specialists will be delighted to advise you without obligation.

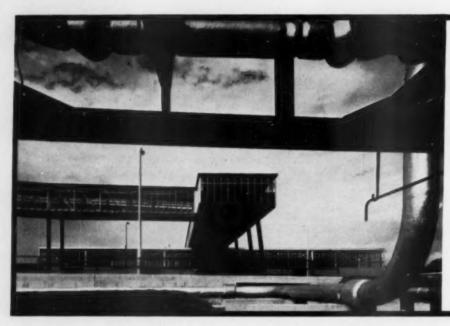


FIXING DEVICES

THE RAWLPLUG COMPANY LTD
CROMWELL ROAD, LONDON, S.W.7



patent glazing is like windows only BIGGER and often it's IN The Roof and it doesn't Have Putty



The new Heinz factory at Wigan is the largest factory to be built in Britain since the war. Shown here is the ancillary can factory, clad in Williams & Williams "Aluminex" vertical patent glazing. The continuous opening lights are gear-operated to give critical control of ventilation.

Architects:
J. Douglass Mathews
and Partners, London
in association with
Skidmore, Owings
and Merrill, New York.

The new Heinz factory is turning depressed Wigan into a boom area. By the time it is in full production it will be employing some 3,000 local people and taking up a good deal of the local agricultural produce, which is both abundant and high in quality.

The 127-acre site has a gradient of I in 40 which has been exploited to give the factory two working levels—both accessible to lorries.

Manufacture starts on the upper level with unloading, storage, preparation and cooking. Products are then gravity fed to the lower level for can filling, sterilization, packing, warehousing and finally dispatch.

The presence of old coal mines underneath the site meant careful positioning of the component buildings. The can factory is therefore at some distance from the food production unit



and is linked to it by a service gantry which feeds the finished cans into the appropriate stage of production process.

forward looking building products WILLIAMS & WILLIAMS

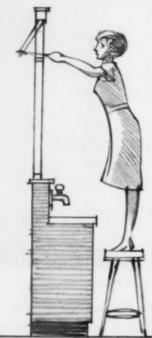


Williams & Williams make steel windows of every description, ALOMEGA and other aluminium windows, movable steel and glass partitioning, ALUMINEX patent glazing, WALLSPAN curtain walling and many other products, all of which can be seen at our permanent window exhibition at No. 36, High Holborn, London, W.C.1.
WILLIAMS & WILLIAMS, RELIANCE WORKS, CHESTER · WILLIAMS HOUSE, 37-39 HIGH HOLBORN, LONDON, W.C.1

HOPE'S CABLE CONTROL

Window Opening Gear needs

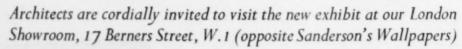
NO ROD, POLE OR PERCH



Away with that old-fashioned window pole for operating out-of-reach ventilators. Install CABLE CONTROL instead. Quickly and unobtrusively, it will open and close the most remote ventilators.

Never perch dangerously on stool or chair to open that window: it is no longer necessary. CABLE CONTROL,

operated from the safest, most convenient point, will do it for you in a trice.

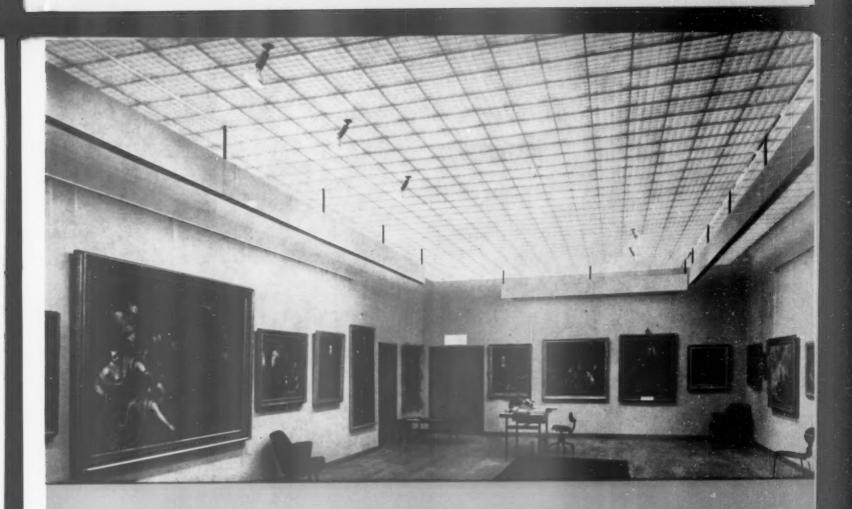


HENRY HOPE & SONS LTD

BIRMINGHAM · LONDON · NEW YORK

MEMBER OF THE METAL WINDOW ASSOCIATION





Lighting and Learning

New light on old masters. Modern lighting technique enhances the paintings in the main gallery of Fine Art at Nottingham University's new Portland building.

A luminous ceiling combined with specially designed 5 ft. fluorescent picture light fittings with Osram warm white tubes.

G.E.C. collaborated with the architects, Cecil Howitt & Partners, and Sir Hugh Casson, who was responsible for interior decoration, in creating lighting schemes for the whole of this building.



G.E.C.

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.



For plasticity and firmness

Plasticity during application and firmness in situ are qualities which characterise a mortar made with Tunnel Masonry Cement.

This material is composed of cement, fillers and plasticisers in finely adjusted proportions. No lime is used in its manufacture, so there is absolutely no risk of blowing, spalling or disintegration when Tunnel Masonry Cement is used. On the contrary the mortar works well, stiffens quickly enough, has adequate strength, bonds well, is durable and provides a pleasing finish.

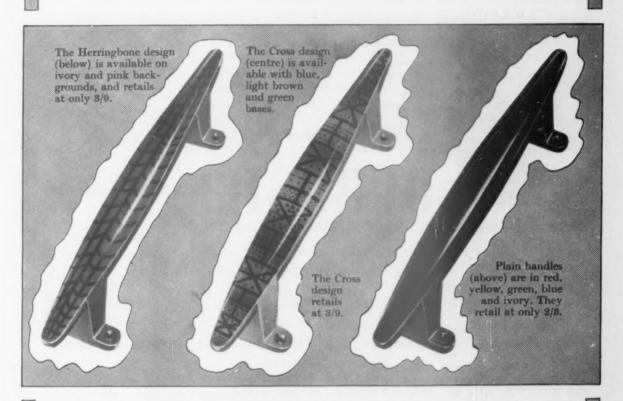


TUNNEL

MASONRY CEMENT

THE TUNNEL PORTLAND CEMENT COMPANY LTD.
105 Piccadilly, London, W.I. Telephone: GROsvenor 4100

Superb NEW range of LACRINOID pulls



Styled for the 'sixties

These beautiful plastics grips will brighten any building. Ideal for kitchen, breakfast room and bathroom. The finish and appearance are just like porcelain, and they're scratchproof too!

LACRINOID

TRADE MARK

Lacrinoid Products Ltd · Gidea Park · Essex · Telephone: Hornchurch 52525

in co-operation with the

BUILDING RESEARCH STATION (D.S.I.R.)

whose assistance we gratefully acknowledge,

and following a suggestion by the

ROYAL INSTITUTE OF BRITISH ARCHITECTS,

we are proud to announce a new range of

CERAMIC TILE COLOURS RELATING TO B.S. 2660

("COLOURS FOR BUILDING AND DECORATIVE PAINTS")

we have called this the

RICHARDS DUROSILK SERIES

AND ARE HAPPY TO SAY THAT THE WHOLE RANGE HAS BEEN ACCEPTED BY
THE COUNCIL OF INDUSTRIAL DESIGN FOR INCLUSION IN

DESIGN INDEX

To assist Architects and Designers the colours of this new DUROSILK range have been systematically selected and tabulated to accord with B.S. 2660. The range consists mainly of colours directly related to this Standard, the appropriate B.S. serial number being shewn in each case. There is also a small group of "carry over" colours matching previous ranges.

We should welcome your enquiries—ask for Folder A101

RICHARDS TILES LTD

Factories: TUNSTALL, STOKE-ON-TRENT (Stoke-on-Trent 87215)
London Office and Showrooms: Grand Buildings, Trafalgar Square, W.C.2. (Whitehall 2486 & 6063).

New for Domestic Heating

The HATTERSLEY CENTRAL HEATING REGULATOR

specially designed for hot water heating installations up to 200°F. and 100 ft. head



Smart and stylish, as modern as the moment, this new Hattersley Regulator is the perfect choice for contemporary installations. The entirely new "Switch-on" fingertip adjustment automatically regulates the radiator heat output. A quarter turn of the ivory coloured heat-resisting control head permits a range of adjustment from fully open to fully

closed, whilst the grey indicator plate shows the exact setting at a glance. The complementary ivory and grey of the head and indicator harmonise perfectly with any decor. An important feature of the Regulator is its extremely low resistance to flow. It can be used on any part of a domestic heating system and no other type of control valve is necessary. The Regulator is precision engineered with a cast gun metal body. Wheel and Lockshield patterns in Standard and Chromium Plated finish are available with connections for either Iron or Copper Pipes.

AN ATTRACTIVE VALVE AT AN ATTRACTIVE PRICE

Please write for details to the sole manufacturers.

HATTERSLEY



the name for good valves

HATTERSLEY (ORMSKIRK) LIMITED · ORMSKIRK · LANCASHIRE
and at HALIFAX and LONDON SW7

...and now

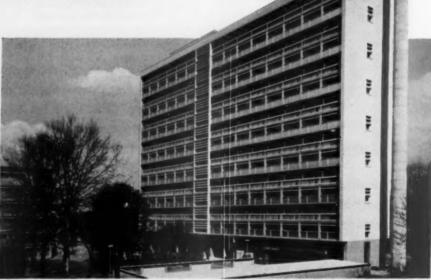
Metered warm air

Weatherfoil Metered Heat provides the best of all worlds for municipal housing. The Weatherfoil system of forced warm air heating provides greater comfort for tenants yet installation and running costs are both exceptionally low. The tenant sets his own thermostat and pays by meter for heat consumed. The really dramatic economies of Weatherfoil Metered Heat are obtained, however, when dwellings are planned right from the start to exploit the unique advantages of the system

FOR MULTIPLE HOUSING

WARM AIR CENTRAL HEATING with . . .

- Low cost installation.
- Economical running.
- Temperature and on/off control in each dwelling.
- Tenant pays by meter.



IS-STOREY MAISONETTES, SCEAUX GARDENS, CAMBERWELL (Photograph by Sam Lambert)
F. O. Hayes, A.R.I.B.A., Borough Architect
A. W. Butler, A.R.I.B.A., Senior Architect
H. P. Trenton, A.R.I.B.A., Architect in Charge

WEATHERFOIL Metered Heat

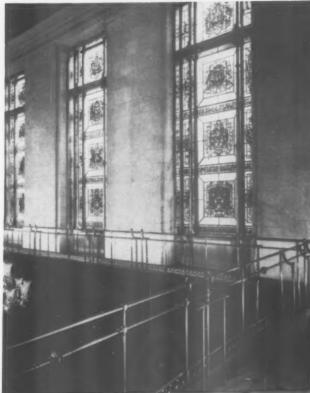
Write for brochure to:-

WEATHERFOIL HEATING SYSTEMS LTD., Head Office: 185 Bath Road, Slough, Buckinghamshire. Phone: Slough 25561

19. BERKELEY STREET, LONDON, W.I. Phone: GROSVENOR \$146

BROADWAY HOUSE, COVENTRY, WARWICKSHIRE Phone: COVENTRY 40110

The Architectural Review March 1960



Merchant Taylors' Hall, E.C. Architects: A. E. Richardson, R.A., and A. E. S. Houfe, FF.R.I.B.A. Windows, sliding doors, balustrading, handrailing and grilles, all in bronze.

Eastbourne Terrace Development.
Architects: C. H. Elsom and Partners.
Entrance screens and doors in anodised aluminium with black dyed aluminium beads.

the idiom is different
...the link is quality



JAMES GIBBONS LTD

METAL WINDOWS · CURTAIN WALLING · LOCKS · IRONMONGERY

St. John's Works · Wolverhampton · 20401

Walkden House · 3-10 Melton Street · London NW1 · EUSton 9145-8

SWITCH AND PLUG UNIT

Introducing a new 60-ampere 550-volt switch and plug unit capable of working continuously at full load in heavy industrial conditions.

Ask for pamphlet 1308





SPECIFICATION

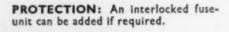
SWITCH: The latest Reyrolle H4 design rated at 60 amperes 550 volts and capable of making and breaking current-surges of up to 360 amperes at 0-3 P.F.



PLUG AND SOCKET: A new addition to the Reyrolle "Easigo" range for industrial duty, available for D.P., T.P., or T.P. & N. service with scraping-earth connection.



INTERLOCKS: The switch cannot be closed with the plug withdrawn or the plug removed while the switch is 'ON'.



Other switch-and-plug units of up to 300-ampere rating are also available.

Reyrolle

A. Reyrolle & Company Limited - Hebburn - County Durham - England



... don't be a pawn! new status for you at work

This life may be one of chequered fortunes, but there's a lot you can do to put luck on your side. To get on in the world, for instance, you need good office furniture as much as you need good clothes and a good manner. This is where Perrings enter the picture. Perrings are masters, past and present, in the art of office furnishing. Why not have them furnish you now with Hille new Status. Checkmate your boss—he'll be forced to give in. And you'll be well on the way to becoming a King on the Board.

THE CONTRACT DIVISION OF



JOHN PERRING

DESIGN

VALUE

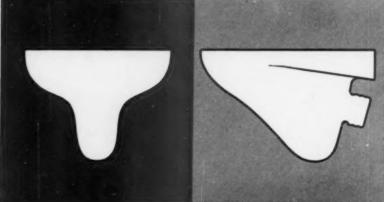
13 BROMPTON ROAD KNIGHTSBRIDGE S.W.3

Phone: KNIghtsbridge 9388 · 9159

Furnishing Stores throughout Southern England



design



material

The 'Standard' Sanwall closet—wall-hung to facilitate floor cleaning—is a refreshingly simple design. Beneath its glazed exterior is 'Standard' vitreous china, a non-porous material. Even without its glaze it is non-absorbent. No moisture can enter the body material and swell it, making a 'mosaic' of the glaze and so letting in more moisture. 'Standard' vitreous china is a clean material. It is strong, too, and highly resistant to breakage. For fine design in a really clean and durable material, always specify 'Standard' vitreous china.

vitreous china by Standard

MANUFACTURED BY IDEAL BOILERS & RADIATORS LIMITED . IDEAL WORKS . HULL

ROWNTREE AND COMPANY LIMITED choose Ceramic Tiles

for their factory at Fawdon, Newcastle-upon-Tyne

In this fine new factory Ceramic Tiles are used on many walls and floor areas in the process and amenity departments.

The colour schemes have been chosen for the best psychological effect and in accordance with the overall interior decor.

Ceramic Tiles are economical, hygienic and reduce re-decorating costs.



Architect: Consultant Architect Rowntree & Co. Ltd.: Main Contractor: Wall Tiling Contractor: Floor Tiling Contractor: S. Greenwood, A.R.I.B.A.

E. H Moorey, M.Inst.R.A.
John Laing and Son Limited
Commercial Marble & Tiles Ltd.
Talbex Ltd. and
The Terrazzo & Tile Co. (Newcastle) Ltd.

Visit the Association's display of ceramic tiles at the Building Centre, Store St., Tottenham Court Rd., W.C.I.

Ceramic

TILES

Glazed & Floor Tile Manufacturers' Association . Federation House . Stoke-on-Trent

HESTIA



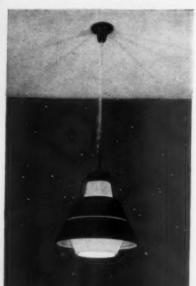
ACHILLES

AJAX





HERA



HERMES



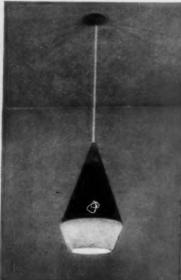
range of contemporary fittings

designed by J. M. Barnicot M.S.I.A. of Falks



RHEA

APOLLO



FALKS

Lighting Engineers and Manufacturers of Lighting Fittings

Send for complete catalogue

91 FARRINGDON ROAD, LONDON, E.C.I. Tel. HOLborn 7654 LONDON SHOWROOMS: 20/22 Mount Street, Park Lane, W.I. Tel. MAYfair 5671/2

AP 101











Braby,

The east supplies the basic idea, but it takes western ingenuity to make a practical job of partitioning for industrial use. Braby construct their Bar-Form metal partitions of extruded aluminium alloy sections, with double dado panels (insulated) for offices, factories, hospitals and other buildings — excluding traditional Japanese houses.



FREDERICK Braby & COMPANY LIMITED

LONDON: 352-364 Euston Road, London, N.W.1
Telephone: EUSton 3456

GLASGOW: Eclipse Works, Petershill Road, Glasgow, N. Telephone: SPRingburn 5151

CRAYFORD . LIVERPOOL . BRISTOL . BELFAST . PLYMOUTH

AP 151



BRAD

ROLLER SHUTTERS

SLIDING SHUTTER DOORS





HAND LIFTS

every time

THE DOORS COMMANDING THE WORLD'S LARGEST SALE

Send for illustrated leaflets 21/SDL

G. Brady & Company Limited, Manchester 4. Telephone COLlyhurst 2797/8/9 and at London, Birmingham, Glasgow, Montreal, Port Credit, Hong Kong.
BRADY FOR EVERY OPENING: BRADY ROLLING DOORS IN STEEL. WOOD AND ALUMINIUM SLIDING SHUTTER DOORS
GRILLES IN STEEL, ALUMINIUM OR NYLON . UP AND OVER DOORS . FIREPROOF DOORS . COLLAPSIBLE GATES . SLIDING DOOR GEAR
RUBBER DOORS . ORNAMENTAL IRONWORK ALSO MANUFACTURERS OF BRADY LIFTS.



for the



where



must do more than decorate



ASSOCIATED LEAD MANUFACTURERS LIMITED

CLEMENTS HOUSE, 14 GRESHAM ST., LONDON, E.C.2 · CRESCENT HOUSE, NEWCASTLE · LEAD WORKS LANE, CHESTER

How long will it last?

We are asked this important question daily. And our short answer is...an ASBESTOLUX lining specification will outlast the life of the building in which it is installed!

THERMAL INSULATION AND FIRE PROTECTION

The new Thermal Insulation (Industrial Buildings) Act, 1957, specifies the kinds of materials which, if used to a substantial extent to achieve the standard of insulation, must either conform to a prescribed standard of resistance to the spread of flame or be used in such a way that they do not add to the risk of fire.

An Asbestolux lining specification will provide a superior standard of insulation and fire protection to the minimum standard as laid down in the new Act, and at the same time ensure EXTREME DURABILITY.

Technical data sheets on constructional details, planned fire protection and specification recommendations, finishes, etc.

You are recommended to write for details or for consultant advice NOW!

ASBESTOLUX

The non-combustible asbestos insulation board



Manufactured by:

CAPE BUILDING PRODUCTS LIMITED, COWLEY BRIDGE WORKS, UXBRIDGE, MIDDX TELEPHONE: UXBRIDGE 4313

AX9



Tomorrow's needs must be planned for, today

Architects and Executives today, concerned with interior planning, need to be in touch with modern interior sales presentation. New developments in materials and merchandise demand it.

The George Parnall organisation base all work carried out for clients on a true appreciation of this need, interpreted according to the highest standards of contemporary design.

Our consultant designers welcome an opportunity to collaborate with architects alive to the urgent needs of tomorrow.

GEORGE PARNALL & CO. LTD.

Craftsmen and Designers

4 BEDFORD SQUARE, LONDON, W.C. I

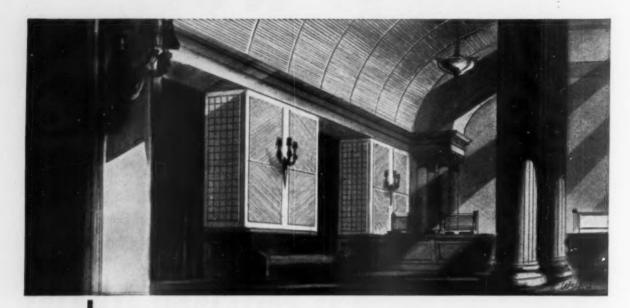
Telephone: MUSeum 7101

REPLANNING AND MODERNISATION





Where silence is golden...



Passed is the day when only the scratch of pen or the tinkle of sovereigns disturbed the church-like quiet of our great banks. The pace of banking business has called for all the mechanical aids available to the modern office—together with their inevitable noise. So banks have been quick to appreciate the need for Hermeseal acoustic installations. These are designed for wall and ceiling treatment in keeping with existing decor—or as an integral part of new construction.

Full information will be supplied on request.

HERMESEAL

HERMESEAL ACOUSTICS LIMITED

Head Office: 4 Park Lane, London, W.1.

Telephone: Grosvenor 4324



A design in radiators

combining clean modern appearance with the long-term advantages of cast-iron

The Ideal Neoline Radiator

consists of cast-iron sections which can be made up to any length required. No matter how long, the radiator presents an unbroken line, top and bottom. The surface is fluted. forming vertical waterways



The fluted panel gives a wide angle of

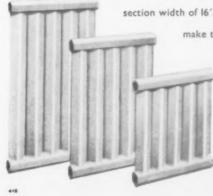
radiation and small integral fins at the rear give high emission area without increasing the distance from wall to the front of the radiator, this being only

3½". The Radiators are available in three heights-18", 24" and 30"-all having a

section width of 16". Clean design, a high efficiency and the long life of cast-iron

make the Neoline Radiator the first choice in schools, offices, private

houses . . . in fact wherever radiators of this type are called for.



CAST-IRON RADIATORS



Manufactured by IDEAL BOILERS & RADIATORS LIMITED . IDEAL WORKS . HULL

where weight

matters

Lightweight aggregate gives...

Maximum workability

LYTAG gives greater workability for a particular mix than any other lightweight aggregate, because its spherical particles present the minimum surface area to be wetted.

Minimum shrinkage and high early strength

The low water contents of LYTAG concretes lead to reduced drying shrinkages and give high early strengths. Surface finishes obtained on precast concrete units are smooth and pleasing.

High fire resistance with low 'U' values

The combustible content of LYTAG is less than \(\frac{1}{2}\)%. It will withstand temperatures of up to 1,000°C without damage. At the same time, it provides a 'U' value well below that of ordinary concrete. For example, the 'U' value of a 6" LYTAG structural concrete element would be less than a half that of the same element in dense concrete.

60%~Air-100%~efficient LYTAG is produced from pulverised fuel ash by a carefully controlled sintering process. Spherical in shape, it has a slightly roughened surface so providing an excellent key for the adhesion of cement.

Technical literature covering all aspects of LYTAG will be forwarded on request. Write to:

LYTAG LIMITED MANOR WAY, BOREHAM WOOD, HERTFORDSHIRE. A LAIMS COMPANY. Telephone Elstree 2854



Dorman Long universal beams have many times the load-carrying capacity of any previously rolled in this country, and are suitable for many bridge spans or heavily loaded buildings without any flange reinforcement.

Moreover, the new Universal mill can roll the basic sections of beams and columns in various weights without changing the rolls, so that the optimum section can be used for each particular job. Just as the beams save work by their high capacity as rolled, so do the columns effect savings; for a range of weights of each column section can be rolled with the same set of rolls, so that columns for multi-storey buildings can be correctly 'graded' without plating, and without awaiting other rolling programmes.

EARLY DELIVERY OF THE FULL RANGE OF SECTIONS

DORMAN LONG



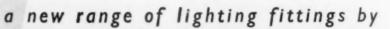
GENERAL PURPOSE LIGHTING

particularly for

SCHOOLS

Designed by Troughton & Young to conform to the requirements of the Ministry of Education, these fittings also have a more general application where an efficient, economic and well-designed fitting is required. The light output of over 90% provides maximum efficiency with minimum glare. Other features include easy assembly, fixing and maintenance.

Descriptive leaflet TYL 22 available on request.



TROUGHTON & YOUNG

TROUGHTON & YOUNG (Lighting) LTD. The Lighting Centre
143 KNIGHTSBRIDGE, LONDON, S.W.1. 'Phone KENsington 3444
and at Rodney Street, Liverpool 1.





BONMOSCHETTO

Convent by Gio Ponti

One of the difficulties in passing an informed judgment on a work such as Le Corbusier's monastery of La Tourette (AR, November, 1958) lies in the lack of comparable works to which it can be related. The recent completion of Gio Ponti's Carmelite nunnery near San Remo, 1, goes some way to

repair this lack by providing extreme example of a comp different way of handling a si problem. As against La Tour conspicuous compactness, the Ca di Bonmoschetto has an irregular expansive plan, 2, in which charac tic 'Ponti shapes' with their p tions and re-entrants-as in the guest-wing-abound. Like all P work it will certainly arouse violent (and probably prejuc objections, particularly to the cu use of an 'artisan mannerist' ga the centre of a split facade, 3, a the detailing which achieves





THE ARCHITECTURAL REVIEW

9-13 QUEEN ANNE'S GATE, WESTMINSTER, SWI WHITEHALL 0611 FIVE SHILLINGS

VOLUME 127 NUMBER 757

SUBSCRIPTION RATE:—The annual post free subscription rate, payable in advance is £3 3s. 0d. sterling, in USA and Canada 810.50, in Italy Live 6940, etsewhere abroad £3 10s. 0d. Italian subscription agents: A. Salto, Vla Santo Spirito 14, Milano; Librerie Dedalo, Via Barberini 75-77, Roma. An index is issued half-yearly and is published as a supplement to the REVIEW.

Directing Editors

J. M. Richards Nikolaus Pevsner H. de C. Hastings Hugh Casson

Executive Editor

J. M. Richards

Assistant Executive Editor Reyner Banham

Assistant Editor (Production) Moira Mathieson

Features Editor Kenneth Browne Technical Editor Lance Wright

Assistant Editor (Counter-Attack) Ian Nairn

Staff Photographers

De Burgh Galwey W. J. Toomey

Advertisement Manager

V. V. Tatlock

CONTENTS

149 World

153 Marginalia

156 Frontispiece

157 The Formal Image; U.S.A.: William H. Jordy

166 Offices, Marylebone Road, London: Architects, Gollins, Melvin, Ward and Partners

175 High London: Kennth Browne

180 Courthouse, Harlow New Town: Architect, Frederick Gibberd

183 1960: The Science Side: A. C. Brothers, M. E. Drummond, R. Llewelyn Davies

191 Interior Design House in Kensington: Architects, James Stirling and James Gowan Conversion in Pitzjohn's Avenue, Hampstead: Architects, Howell, Killick and Partridge

196 William Morris's Designs for Stained Glass: A. C. Sewter

201 Current Architecture

Miscellany

206 Exhibitions

208 Functional Tradition

209 Counter-Attack

Timber Roofing Components: G. C. A. Tanner

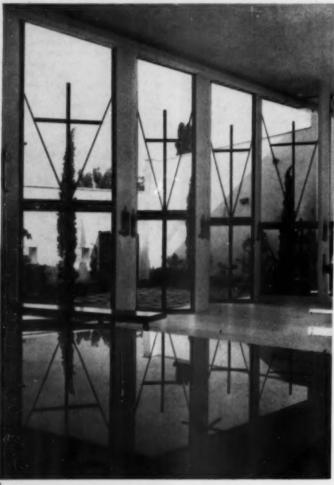
216 The Industry

220 Contractors

Bonmoschetto

on the other hand, being in clausura, remain in their choir behind the grille seen in 4, which affords them a view of the altar. This, in its turn, stands at the more enclosed end of a building within the garden-court, a building

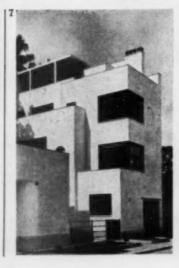
walled in tall windows standing between structural fins that lie more or less on the line of sight from the altar, 6, so that they neither obstruct the view of the garden-court from within, nor the view of the altar enjoyed by the public worshipping in the garden.



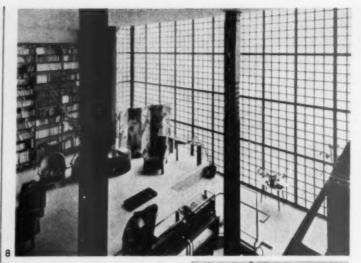
REVUES D'ART

The attitude of French 'art-maga zines' toward architecture is something of an example to their contemporaries in other countries. Only New York Art News has what might really be called a distinguished record in this field, but even that is not to be matched against the regular monthly coverage afforded by that Parisian combination of avant-garde and grande luxe, L'Oeil (less avant-garde than it used to be, admittedly). Its net has been cast wide enough to cover not only recent work in France, and Peter Blake's article on the architecture of The End of the XX Century, but also to look back over pioneer modern works by not-quite-famous architects in Paris. In its Christmas number for 1959, it reviewed the work of Rob Mallet Stevens, including the hous in the street that bears his name, 7,

L'ŒIL CIMAISE







and the solitary masterpiece of a forgotten master, the Maison de Verre of Pierre Chareau. This resounding coda to the machine aesthetic of the Twenties, with its superlative glasswalled living room, 8, its pre-occupation with glass, steel and mechanical services, 9, was completed in 1931, to the designs of Chareau in collaboration with the Dutch architect Bijvoet. and became so much of a legend that the name of Mart Stam, himself something of a legend, has also been coupled with it on occasions-which is stylistically plausible though not supported by any solid evidence.

In the meantime, the slightly more senior, and much more avant-garde magazine Cimaise, has celebrated the beginning of its seventh year of turbulent publication by increasing its format, its number of pages, and its scope—the last by the inclusion of an architectural section under the editorship of André Wogensky, former chef d'atelier to Le Corbusier, with the assistance of Michel Ragon. This is a valuable addition to world periodicals on architecture since its text is multi-lingual (English, French, Spanish, German) and it provides a platform for a section of French architectural opinion which is somewhat more radical and rather younger than that represented by, say, Architecture d'Aujourd'hui. However, the line adopted by Wogensky in his inaugural manifesto is not so radical as to be utterly outré-'Architecture is an Art. We want this to be our first statement in a period where, if this truth is not denied openly, architecture is at least menaced by technique. Today technique offers means of realization that



are prodigiously rich. But, precisely, this richness is a danger. For, with an attitude of facility aiding it, technical richness tries to replace architectural thought just as in the decadent periods when decoration stifled architecture.' And there follows—three propositions later—a not altogether unexpected demand for the synthesis of the major plastic arts.

In fact, the ensuing texts and the works selected for illustration and description all stand in a line that is clearly descended from Le Corbusier himself, including the Master's scheme for Saint-Dié, and the Maison de Brésil in the Cité Universitaire. The one architect selected for extensive discussion is—and this too may be characteristic of the 'Nouvelle Vague'



THE 'PARK LANE' SUITE





with SANKEY-ROYAL chairs

Imposing, spacious and smoothly efficient as only steel furniture can be, the Park Lane suite embodies a new conception of executive elegance. Melamine plastic tops...contemporary contrasting drawers. Details can be varied to suit your requirements exactly. Sankey-Royal chairs, in square tube, luxuriously upholstered, are designed and finished in harmony. Please write for illustrated brochures.



Samkey-Sheldom

of course!



46, CANNON STREET, LONDON E.C.4. TELEPHONE: CITY 4477 (18 LINES)

AND AT BELFAST, BIRMINGHAM, BRISTOL, CARDIFF, COVENTRY, EDINBURGH, GLASGOW,

LEEDS, LEICESTER, LIVERPOOL, MANCHESTER, NEWCASTLE-UPON-TYNE, SHEFFIELD AND AGENTS THROUGHOUT THE WORLD.

ARCHITECTS PLEASE NOTE: THE EDINBURGH WEAVERS TRAVELLING **EXHIBITION** WILL BE SHOWN AT PUGH BROS LLANELLY MARCH 1-10 **PIMMS GUILDFORD** APRIL 5-14 **POPHAMS** PLYMOUTH APRIL 19-28 DON'T FORGET!

Revues d'Art

in French modern architecture—Jean Dubuisson, one of those Rome-prize-winners revolté (others are Bernard Zehrfuss and Guillaume Gillet) who add to their radicalism a degree of professional finesse rarely found in their like-minded contemporaries in other countries. Dubuisson is best known outside France for his work on SHAPE-village, 10, but Cimaise also illustrates projects for Africa and various sites in France, and HLM housing at Commercy.

COLUMETA

A 'cast iron brief' is something that every architect hopes for from his clients, but a rolled steel brief might be a better ideal in view of the programme given Rein Fledderus by Columeta (Comptoir Luxembourgeois des Usines de Metaux) for the design of their sales office in Rotterdam, 11.



According to the Dutch magazine Bouw (28 November, 1959) Columeta's house architect put down their requirements in the following terms 'Turn this old terrace house (at Eendrachtsweg 50) into a building representative of our sales organization, with maximum usability as offices and accommodation for our directors and engineers when they are working in Holland. Make it clear that we sell steel girders, piling and profiles. Make a modern building and for the rest you are as free as the budget allows.'

Fledderus's solution is mildly traditional in its section, with the familiar helf-elevated ground floor and semicellar of the typical Dutch town-house, office space on the ground and first floor, executive suite and apartment on the balconied second, and housekeeper's flat at the top. But the elevation, as will be seen, is as modern as a progressive industrial combine could wish, and makes it perfectly clear that steel is their business—though without contrived 'advertising,' since the conspicuous RSJ that runs right up the glass, blue-green and stainless-steel facade is structural, one of a row of four stanchions at one-third span.

EAST-WEST DOMESTIC

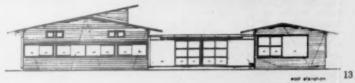
Disappointing as it may be to purists, though hardly surprising even to them, the fascination of the Japanese house for European architects seems to increase as it becomes more Westernized. Of the constant stream of charming little houses published over the last few years by The Japan Architect, few have attracted more delighted comment than that which the JA describes with its customary reticence as 'Mr. U's house,' 12. Designed by Makoto Masuzawa, who is noted for pursuing an independent line between Eastern and Western domestic design, it reveals at once, on its exteriors, an elegant fusion (that is no compromise) of the Western concept of a glazed wall with the Japanese concept of sliding screens, phrased in the most reticent and disciplined

But the planwise concept of the house is even more interesting in its combination of two differing domestic traditions, the main body being connected by a low corridor, seen in the elevation, 13, to a separate pavilion for the occupier's aged mother, whose private room has still the traditional tatami matted floor. The main house, however, is conceived in terms of a chair-using way of life, and achieves -in Western eyes-its most ingenious aspects in the children's room, which runs the full width of the house (its long run of windows is seen on the main gable elevation in 13) and has the desks and bookshelves proper to a professor's family, surmounted by a row of four bunks to which access is gained by the cat-ladders seen in 14. This solution—the small windows corresponding in position to the children's pillows are also seen in 13-has some feeling of the ship's-cabin aesthetic discussed in this month's Interior Design supplement, pages 191-195

Inevitably, the lesson of Japan has not gone unnoticed in Europe, and Denmark now boasts at least one consciously Japanese house, 15, de-





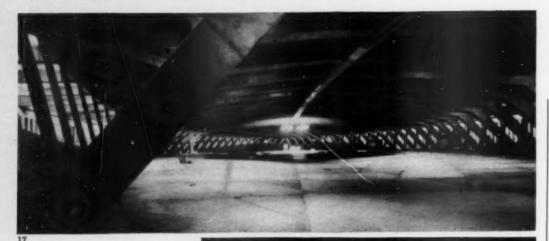




signed for his own occupation by Haldor Gunnlogsen. In plan and in general conception this remains a western house of a broadly Miesian persuasion, but it does, in such parts as the entrance hall, achieve something of the puritansk strenghed (as it is called in Bonytt, 1, 1960) of the best Japanese traditional design, although one misses, 16, the over-head elaboration, and richness of the roof construction of that tradition.



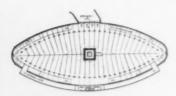
SUBTERRANEAN ARCHITECTURE



NON-MONUMENT

A spectacular example of what it might well be fashionable to describe as an anti-building or non-monument is afforded by the basilica of St. Pius X at Lourdes, an enormous mandorlashaped church holding twenty-thousand worshippers but invisible above ground level. Over six-hundred feet long, this complex structure of portal frames bearing on a central bracing beam is the work of a team that brings together such great names as Vago and Freyssinet with Le Donne and Pinsard as executive architects. In spite of its length and a central clearspan of over 190 feet, this vast hall is extremely shallow, 17, the greatest height from floor-level to top of roof being just on thirty-two feet. The reason for this vertical compression of structure so ample in all other measures, stems from a fundamental decision that the creation of this church should not materially affect the traditional aspect of the approach to the pilgrimage church and miraculous grotto, and this, in turn, meant that there was no alternative to sinking the whole structure as far as possible in the soil of the watermeadows ad-

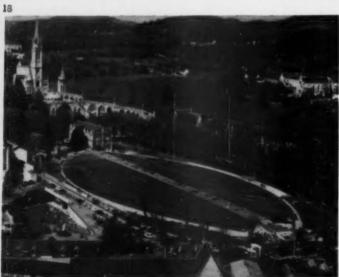
joining the river Gave. Since it was necessary to give the building the minimum elevation above natural ground level, compatible with not taking it too far below the natural water-table, the flattest possible vault was needed. The success of the enterprise can be judged from the aerial view, 18, of the reinstated meadow which is, in fact, some feet above its original level, though this would hardly be suspected except by a well-briefed visitor. Both in its absence of facades and the rude strength of its interior, 19, there is something Early Christian about the basilica, with the all-important proviso



that—from the engineering point of view—it is a work of tremendous sophistication, both in its preliminaries (such as the surveying of the site), its design (the mathematics of these pre-stressed portal-frames is daunting), its execution and, particularly, its site organization—concrete-mixing and the preparation of rods and cables for reinforcement and post-tensioning had all to be carried on in the exiguous triangle of land adjoining the Pilgrims Hostel seen at the far end of the meadow in 18.

BIG DIG

Not quite architecture, perhaps, in the sense that it is not a building, but still a monumental exercise in the moulding of space, the tail-race tunnel of the Stornorrfors power-station in Sweden constitutes one of the most impressive holes in the ground. 20, recently made by man. Just over four kilometres in length, and part of an excavating programme that involved moving 2,750,000 cubic metres of rock and nearly the same amount of earth, the tunnel has a cross-section of





Ibstock Facing Bricks

were used for the new Science Extension at Bryanston School, Dorset



which will blend in naturally with the existing

Architects everywhere specify Ibstock Facing Bricks for durability and appearance.

Send for samples and full details



IBSTOCK BRICK & TILE COMPANY LIMITED, Ibstock near Leicester London: B.R. Goods Depot, Wright's Lane, Kensington, W.8.

Telephone: Ibstock 591 (3 lines) Telephone: Western 1281 (2 lines)

The Architectural Review March 1960



By Appointment to Her Majesty The Queen Manufacturers of Kitchen Equipment



We are proud to have been selected as main contractors for the design and construction of the new staff canteen at

FORTNUM & MASON'S

We have 80 years' experience in the manufacture and installation of catering and kitchen equipment and would welcome the opportunity of offering our services to you.

W. M. STILL & SONS LTD

29-31, GREVILLE STREET, LONDON, E.C.I. Tel: HOLborn 3744

BRANCHES AT: BRISTOL: MANCHESTER: GLASGOW

AP293

views and reviews

MARGINALIA

WOBURN WALK RESTORED

It is a common enough rhetorical trope to use the words Borough Engineer as a synonym for insensitivity in matters of Townscape, and it is therefore the more welcome to be able to give credit that is patently due, to the Borough Engineer of St. Pancras, Mr. C. S. Bainbridge, for his restoraof one of London's miniature shopping precincts, Woburn Walk, 1, just south of St. Pancras Church. The whole enterprise is a commendable example of a local authority making full use of its powers, first under the 1947 Town Planning Act to make a Building Preservation Order, and then under the Ancient Buildings and Historic Monuments Act of 1953 to apply for a grant to acquire and purchase. These operations-which are also notable in regarding a work of 1822 as worth preservation, well ahead of public taste—involved only the block on the south side of the Walk, that on the north was in different hands, and not likely to be allowed to fall into such acute disrepair.

The actual work of restoration has involved not only the St. Pancras Borough Council, but also the Georgian Group and the Ministry of Works, and proved far more complicated and delicate than might be expected of eight small three-storey structures. A complete report has been published by St. Pancras Borough Council as The Restoration of 4 to 18 Woburn Walk, and further enquiries about it (and let us hope they are many) should be addressed to the Town Hall, Euston Road, London, N.W.1.

facturers (their London showrooms were illustrated in the AR, December, 1959) and one of Britain's fastestgrowing industrial concerns. The scheme, which involves the enlargement of an existing reservoir alongside their works at St. Helens, Lancs., into an artificial lake, and the grouping of a sequence of new buildings around it, has been designed by E. Maxwell Fry (of Fry, Drew, Drake and Lasdun) with Peter Bond as assistant in charge. A canteen block will span the northern

PILKINGTON PROJECT

An extensive headquarters-building programme has been announced by Pilkington Brothers, the glass-manu-

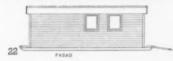
end of this lake, as seen in 3, and the

main office accommodation will be in the group clustered round the two open courts adjoining the other end of the water. One of these courts is effectively boxed in by the surrounding buildings, but the other is open to pedestrian access by underpasses beneath the surrounding offices and the foot of the tower-block-2 shows the view from the head of the causeway that connects the new buildings with the works on the other side of the lake.

MASS SOPHISTICATION

The excursions of the 'home magazines' into the commissioning of architecture are commonly regarded with apprehension in the profession, but they remain, for all their commercial entanglements with nonarchitectural domestic interests, one of the most direct and effective lines of communication between architects and the general public. Much of the apprehension stems from the apparently irresponsible choice of architects, but no such criticism could be levelled at the Woman's Journal House of the Year for 1960, which has been built at Woolton, outside Liverpool. The architects here were an un-obvious but intelligent choice; Gerald Beech and Dewi Prys-Thomas, both on the staff of the Liverpool school of architecture, a school which still breathes the most aesthetically sophisticated atmosphere of any in Britain.





almost thirty feet by eighty, and involved the construction of two ancillary tunnels to give tractors and trucks access to the workings. This last point draws attention to an important change that has come over techniques tunneling almost noticed by the lay public. No longer to be regarded as a branch of mining, dependent on miniature railways for internal transport, tunnel-building is now a branch of earth-moving, and the familiar earth-mover's tackletractor-loaders, bull-dozers and dumptrucks are taking over the transport side, even though drilling and blasting still follow a version (a far more sophisticated version, nowadays) of the traditional techniques described in the heroic books on civil engineering that we read in our youth.

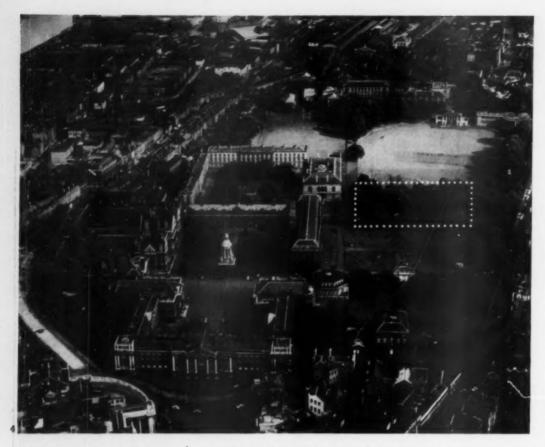
The change is best symbolized by the wide divergence of the equipment used to service and finish off the earth moving operations. The latter requirement produced the stranger-thanscience-fiction Hiss-Nisse platform arm, 21, used for work and inspection at roof-level, and very necessary in an operation such as this, not only for checking the stability of the living rock from which the tunnel was cut, but also for ensuring that there is nothing that might disturb the flow of water-which will eventually reach 800 cubic metres per second-nor be disturbed by it. The actual work platform can be raised to a height of nearly eighty feet, under hydraulic control from the platform itself.

In contrast to this sophisticated piece of machinery, fairly typical of the kind of extreme development of specialist equipment that earthmoving often produces, stand the mobile workshops required for servicing the rock drills and re-setting their cutting tools, 22. These are, quite simply wooden huts on steel runners, and although they were devised in advance, the manner of their devising, suggests something of that capacity to improvise in the field with available materials-contractors' huts and steel angles-that is also a mark of earthmoving techniques at their best.









As a result, the design repays acrutinyfor instance, the arrangement of the windows on the upper floor, 5, which is the sort of thing that we are endlessly accustomed to see in brick, concrete, ragstone or anything else, makes much better sense when the structure, as here, is in wood (the only other place where it makes equally good sense is in the calculated brickwork of Stirling and Gowan's flats at Ham Common, but Stirling, of course, is a Liverpool graduate). Even more to the point, however, is the relation of upper and lower floors. The lower is wide and thin, occupying

the site almost from one side to the other, in order to eliminate through views to the back garden, but is thin from back to front in order not to consume too much ground. The upper floor, contrariwise, is disposed the other way about, deep from back to front but standing well in from the boundaries of the site. The result would give, in a complete development of this type, a reasonable combination of terrace-house continuity and detached individuality.



A chance has arisen to make the phrase 'as fine as Trinity Library' no longer synonymous with Wren's work Cambridge-or, at least, not exclusively synonymous with it. Very high hopes are entertained of the recently-announced competition for new library for Trinity College, Dublin, of which the preliminary details have been given along with an appeal for additional funds to see the work through to a worthy conclusion.

As the aerial photograph, 4, shows, the site of the new library, indicated by a dotted rectangle, is an invitation extend and enhance a classic collegiate layout, one that shows how much a courtyard scheme can profit by a variety of styles in the buildings that frame its quads. Continuing stylistic variety is clearly implied in the general terms of the competition, which propose not to demand a Neo-Georgian building, but 'a design in contemporary idiom which will express the middle of the twentieth century as faithfully as the building of 1712 expresses the age of reason."

The choice of the panel of assessors,

OBITUARY PETER FLOUD 1911-60

The death of Peter Floud is a terrible loss. The study of Victorian design in Britain is at last coming into its own, and Peter Floud was the only scholar who was doing consistent, thorough and imaginative research into this subject. His approach to William Morris amounted to a complete reassessment, and his findings at the Patent Office promised to lead to a revolution in everybody's views of Victorian pattern design in general. His results up to date were published THE ARCHITECTURAL REVIEW in July, 1959 (Vol. 126).

Peter Floud never wrote a book. He disliked the limelight and was wholly satisfied with the work done. This is why his name was less familiar



than those of many a lesser man. Even the exhibition of Victorian and Edwardian Decorative Arts of 1952, which is known to his colleagues internationally as Peter Floud's Exhibition, had his name only in the last line of the foreword, after those of his five collaborators. He was a retiring man, with a somewhat forbidding facade, but the most engaging smile and the warmest helpfulness once he had measured up a visitor and found him worthwhile. His capacity to work was exceptional and his face and manner, in spite of his forty-eight years, those of a young man. N.P.

CORRECTION

In the October, 1959, AR on page 205, the design of Massey House at Wellington should have been credited to Plishke and Firth.

CORRESPONDENCE

EARLY FRAMED BUILDINGS

To the Editors.

Sirs,-I should like to make a correction in the caption of one of the photographs in my article, 'Charles H. Caldwell and the Frame of Steel' in the November issue of THE ARCHITEC-TURAL REVIEW. The caption for photograph No. 3, on page 289, should have indicated that the building shown is framed in reinforced concrete, not in steel.

Yours, etc., LEONARD K. EATON. University of Michigan.

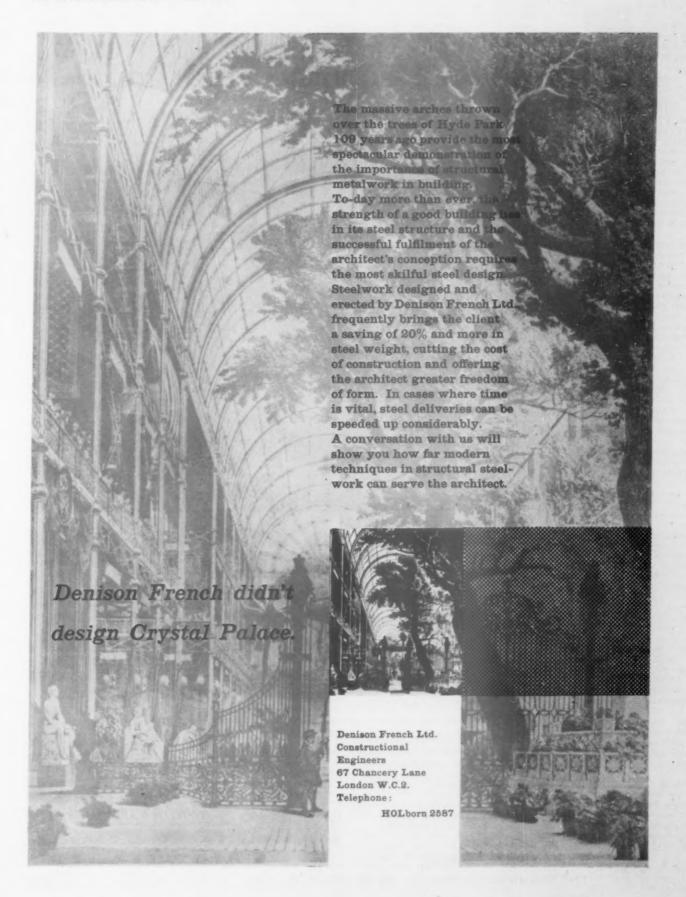
OXFORD RELIEVED

To the Editors.

Sirs,-In your note 'Oxford Relieved-the Figures' in your January, 1960, issue, you mention that figures provided by the Road Research Laboratory 'support the proposals made by THE ARCHITECTURAL REVIEW as long ago as May, 1956,' thusunwittingly, no doubt-giving the impression that the proposals originated there and then. I think it is worth remembering that they were, in



international in make up, suggests that these terms will be interpreted liberally in terms of style, but stringently in terms of function and relation to other buildings on the site, since the five members of the panel are: Lord Rosse, Vice-chancellor of the University of Dublin; Keyes DeWitt Metcalf, Harvard library expert and Professor of Bibliography; Raymond McGrath, one of the few distinguished modern architects Ireland has produced; Sir Hugh Casson, and Franco Albini, Professor of Architecture in the University of Venice. Professor Albini's discretion and brilliance in introducing uncompromising new work into old settings is amply attested by his two famous museums in Genoa, the Palazzo Bianco and the Treasury of the Cathedral (also AR, November, 1959). The detailed conditions of the competition, which will follow IUA standards and procedure, are expected to be issued shortly.



CASTROL HOUSE

Planned from the word 'go'...



...with '846' unit furniture



Individual '846' units look equally distinctive and are equally functional in managerial, secretarial or reception offices.

Castrol House embodies the most up-to-date ideas in design, decor and functional equipment.

Thus, long before the staff moved in, their functions were considered and provided for—every clerical operative had all the tools for his particular job to hand, and his place in the flow of work was carefully considered in relation to the whole department.

Unnecessary motion, wasted labour and superfluous actions were eliminated, and the productive output of each department was planned to the optimum.

Shannon '846' permitted all this—and provided the modern streamlined appearance and the quality furniture essential for so great an undertaking as the Wakefield-Castrol Group. Responsible executives can learn all about basic '846' planning from 'Functional Furniture'—a full-colour booklet which deals with the science of modern office planning (free on request).



Ьу



O & M TO BRITISH BUSINESS
THE SHANNON LIMITED

59 SHANNON CORNER . NEW MALDEN . SURREY

all but small detail, made by Dr. Thomas Sharp as long ago as March, 1947. They are thus thirteen years old, and the traffic thirteen years worse.

Yours, etc.,
Andor Gomme.
University of Glasgow.

COMMONWEALTH

To the Editors.

Sirs,—I have read your Commonwealth Issue with disappointment and dismay.

The first matter of concern to me personally is the anonymity with which the editorial has been handled. since, by reason of the credit line on the contents page, it could be inferred that I was a party to all or even some of the sentiments expressed by the author of the article on South Africa. Not only do I find factual errors, but also remarks which I consider unbecoming to a journal which I have looked upon as a responsible publication, serving the profession of architecture. Moreover, assessments arrived at in their sweeping brevity are distorted and often misinformed. In fact the whole tenor of the article would suggest an animosity and cynicism, perhaps unintentional, which is merely damning in its faint praise.

You cannot but be aware of the fact that rapid urbanization of the Union is bringing an increasing number of Afrikaans-speaking members of the community into the professions, not the least into that of architecture. The statement that 'nearly all that is worth illustrating here is English' is misleading and inexplicable when, on the following pages, you reproduce work by C. Strauss Brink, Meiring and Naude, Verhoef, Smit and Viljoen and Olaf Pretorius, and elsewhere make reference to the fact that architecture is the work of resident architects, the majority of whom have been trained in the Union. To such members of our profession and to my Afrikaansspeaking colleagues such a statement merely becomes offensive.

Reference to a 'state of tensions' which may have some political significance would seem to have little bearing on the subject since it is a state not generally apparent at social and cultural levels, nor is a statement like 'Mismanagement by the Nationalist Government' likely to promote concord. There are a number of other statements which ought to be corrected.

The census for 1956-57 gives the relative proportion of English and Afrikaans-speaking as 45 per cent and 50 per cent respectively. The earliest work of a 'contemporary' nature was initiated by Rex Martienssen, Gordon McIntosh and Norman Hanson; John Fassler entering the field later. In regard to Native housing, no reference is made to the extensive research and planning carried out by the National Building Research Institute over a period of some ten years, nor to the enormity of the problem posed by the acute shortage of housing for the urban Native peoples that arose during and after World War II, and which then amounted to some 157,000 dwelling units. It was the concentration on the war effort which put the brake on

building of all kinds and which gave rise to the so-called 'disgrace' to which you refer. To date, something like 90,000 dwellings together with basic social amenities have been provided on the Reef alone, at a cost of some 24 million pounds. While visual deficiencies are admitted, nowhere else on the Continent can a similar achievement meeting a similar emergency be found.

The minor typographical errors in the issue I do not propose to refer to at this stage.

In conclusion, I wish to dissociate myself entirely from this particular article. I was personally responsible only for the article on South Africa which appeared under the title 'Building Industries,' and the supply of certain illustrations.

Yours, etc., W. Duncan Howie. University of the Witwatersrand, Johannesburg.

To the Editors.

Sirs, - I have no doubt that each Commonwealth subscriber to your October issue has carefully read the introductory matter relating to his own country in the hope of detecting an error with which to poultice the wounds of criticism or omission. In the case of New Zealand architecture, the scope and adequacy of your coverage should give rise to no such churlishness: we are presented in a light perhaps more flattering than we deserve. However, I have a bunion of different sort which has trodden upon so severely that I am unable to stifle a cry of pain. The last paragraph in the text introducing New Zealand work is too much to bear.

I quote: 'Physical planning is a latter day activity. It is also a matter of subtlety. Pioneers don't need it.' . . . and earlier: 'There is no town planning (in New Zealand) worth speaking of, either in central or suburban areas.'

The lack of subtlety one may readily concede. But that surely is not the whole substance of planning? The more urgent husbandry of resources and the general guidance of development are the very stuff of both physical planning and pioneering. The pioneer who fails to plan is a fool, and a suicidal fool at that. Your author has suspected the weakness of his standpoint in the last sentence of his final paragraph. He expresses the fear that his view of town planning may be 'looked at by (New Zealand) architects themselves as an old man's game just as much as sensitive detailing. How right he is. While Auckland alone consumes land at the rate of about two thousand acres each year. what chance is there for subtlety? For the present we are too busy New Zealanders impressing upon that what your article claims to be a country 'on the whole cultivated throughout' is in fact only habitable over about two-thirds of its area and that only one-tenth of it is highly productive. We plan its use or we

For example, after more than ten years of effort, the advice of the Auckland Regional Planning Authority is now automatically sought on all

issues affecting the development of an area of over 2,000 square miles containing 20 per cent of our population. There are many others at work, among whom not the least are the three 'lav' men who constitute the Town and Country Planning Appeal Board. To them has been brought every private and public planning dispute in the country for the last five years or so. In their decisions lies a growing body of support for elementary planning principle which, by the consistency of its application throughout New Zealand by these gentlemen, represents a powerful encouragement to Local Authorities faced with the need to make unpopular planning proposals. It also represents a major advance in the achievement of a basis for that sort of town planning which your correspondent failed to detect here. What is now so nearly established is a consistent policy of land use. I am not sure that the next step is not one for the architects.

Yours, etc.,
I. B. REYNOLDS.
Auckland, N.Z.

BOOK REVIEWS

TRENDS

MODERN ARCHITECTURE IN BRITAIN.

By Trevor Dannatt, with an introduction by
John Summerson. B. T. Batsford. 63s.

This book, based on the material exhibited by the Arts Council in 1956, has all the qualities and defects of its origin. It does present a rather comprehensive picture of British architecture since the war, but in the way of a catalogue which accurately states facts and figures, without going into critical arguments and evaluation.

The buildings illustrated are divided into five sections according to their type (industries, offices and shops education, housing and social buildings). Such a system makes it impossible to recognize the architectural personalities of modern Britain. One for instance, three works by Powell and Moya scattered through the book, at pages 112, 137 and 207, without any reference to each other, as if the very fact that they were conceived by the same firm had no relevance whatsoever. Fifty years ago, we had a lot of books which catalogued Roman or Mediaeval capitals, Renaissance doorways or Baroque cupolas. We have now substituted functional types for formal types, but the result, from a critical viewpoint, is about the same. Just as a pediment cannot be understood if taken out of the context of the whole building organism, a 'type' is meaningless and abstract if the personal interpretation given by the architect is not considered. There is indeed more analogy between the Langham House development and the House in the Isla of Wight by Stirling and Gowan than there is between the latter and the two others by Peter Moro and Tayler and Green to which it is related in the sequence of the book. The building programme, undoubtedly, is very important, but architecture is the result of the interpretation of functions and types, and often of the very

'invention' of them. A catalogue of buildings without architects cannot do justice to the British postwar effort.

The same system of classification is responsible for the rather confusing historical consecutio which emerges as we turn over the pages of the book. The Roehampton Estate is published on page 130, while the Royal Festival Hall, built about five years before, is illustrated only on page 199. The Gatwick Airport can be found on page 52, while the design for the new Coventry Cathedral is on page 210. Thus, the process of architectural ideas and experiments, as it developed since the war, becomes rather hard to grasp. The transition from the 'austerity' period to the Festival, and then to the 'prosperity' of recent years does not come through as clearly as it could have done if the buildings had been published according to chronological criteria. Sir John Summerson's introduction,

however, is worth the whole book. It is one of the most profound and at the same time wittiest essays on the modern movement that one can read. His analysis of British architectural thought, from the attitude 'towards an architecture' of the 'thirties to the present 'architecture now or nothing' realism, is most persuasive. The author holds that in English architecture the years 1945-57 can more correctly be examined as the end of one phase than as the beginning of another. He sees a continuity of ideas from 1927 to 1957, which is more or less the life span of the MARS Group, of the 'intellectuals,' of the 'emigres. of the 'brave-new-world.' The spirit of architecture as a 'cause' or a 'programme' followed the ideologies of the Welfare State, of the schools, housing and New Towns adventures, perhaps with the parenthesis of the Festival. These ideas are now being superseded, Sir John says, 'though I am neither percipient enough nor young enough to see by what." Actually, being a very fine critic, he explains exactly the reasons for the dissipation of the ideas of the 'thirties: 'Being adopted as a cause, it (modern architecture) was constantly in danger of being encouraged as a style,' he writes. In point of fact, Trevor Dannatt's catalogue is the appropriate editorial expression of a style, based on types. But it is quite evident that Chamberlin, Powell and Bon's Seed Factory, Ernö Goldfinger's Office Building in Albemarle Street, the School in Derbyshire by the Architects' Co-Partnership, Drake and Lasdun's Halifield primary school, and many other buildings illustrated in the book are already out of the To be sure, their 'style.' 'cause' exists, but it is not the same as that of the 'thirties. The New Brutalism, the Sensualism, the architectural teddy-boys' attitude is the compensation for a new realism.

Sir John Summerson believes that there is now something that was not there before the war, a real school of modern design in Great Britain. There is a general agreement on being radical, 'to be continuously critical of results and to go back again and again to the programme and wrestle with its implications till it yields an answer which has the stamp of reality.' I am happy to agree with this optimistic conclusion



The Royal Academy's winter exhibition offers many architectural exemplars of its theme, 'Italian Art and Britain,' but none more exotic than this painting by Pannini from the Hamilton collection, showing the Palazzo Muti Balestra in Rome. The romantic sapects of the scene are many layers deep, since the Britons concerned were the exiled Stuart princes. Their palace exhibits, not its workaday façade, but a false front drawn over it to celebrate a Festa. Beyond this point the romantic becomes the mysterious because the precise Festa has not been identified but the arms to the right of the cresting are read as those of Benedict XIV, who was Pope from 1740 to 1758, and whose major conjunction with the 'House' of Stuart would have been the creation of Prince Henry Benedict a cardinal in 1747.

THE FORMAL IMAGE: USA

All round the world, architectural thinkers are trying to come to terms with the new classicizing trend in US architecture—as unexpected and portentous a development in the history of the modern movement as Le Corbusier's chapel at Ronchamp. In last month's AR, Reyner Banham treated it simply as a return to the professional traditions of architecture, but there is clearly more to it than that. American writers, in particular, have been assessing its implications and many of them have come to hostile conclusions, notably Peter Blake in a speech at Cornell, Serge Chermayeff in an important lecture at Harvard, and Thomas B. Hess in a review of the Museum of Modern Art exhibition in which the trend was first revealed.

But the situation is not necessarily one that calls for complaints. US architecture has seen previous classical revivals, and been permanently enriched by them. In his analytical survey of this trend and its outstanding monuments, Professor Jordy starts with the Seagram Building, which formed the subject of his earlier analytical article in the AR (December, 1958)—a building that has not attracted the same hostile comments as other recent examples of US formalism, yet goes on to discuss the technical as well as aesthetic and social mechanisms that have helped to produce the new style. In doing so he makes a distinction that has not been sufficiently clearly made before, between those modern Formalists who depend on the classical tradition, including the classical art of non-European civilizations, and those formalisms that depend like Ronchamp on other sources of inspiration. Professor Jordy deals here specifically with developments that are so thoroughly in the classical tradition that he can justifiably call them Mannerist.

It was singularly appropriate that the first outstanding monument of the new formalism—Mies's Seagram Building—should have appeared in the United States. Mysterious though the reasons are, American architects have recurrently embraced classicistic formalism with exceptional fervour. Thus, Thomas Jefferson's Capitol for Virginia, 1 (overleaf), was the first use anywhere in the world of the complete temple form in modern architecture, save for its earlier appearance as small garden structures. The

Greek revival, of which this temple is the herald despite its Roman inspiration, was uniquely prevalent in the United States, while perhaps no other country so fully explored the range of its expressive possibilities. Again, in the nineties, it was in Chicago, at the Columbian Exposition, 2, that the Ecole projet materialized. Shortly thereafter, foreign observers registered astonishment at the greater correctness or literalness of American classicism, while Henry-Russell Hitchcock in his recent survey of twentieth-





1, Clérisseau's plaster model for the State Capitol of Virginia at Richmond, designed with Thomas Jefferson as a free version of the Maison Carrée while Jefferson served as Ambassador to France. It was shipped to Virginia where local builders eliminaled the elegant French neo-classical detail for a plainer, more vigorous carpenter's version: 1785. 2, the Columbian Exposition, Chicago, showing American architecture dominated by the principles of the Ecole des Beaux Arts: 1893.

century academicism reached the same surprising conclusion1.

Now there are signs that a new formalism is appearing in modern architecture. And, interestingly enough, it is most evident in America. Its most conspicuous appearance is the final version of the much redesigned Lincoln Centre for the Performing Arts in New York, 6 and 7 on page 161. Here, in the Philharmonic Hall, a symmetrical axis, portico and colonnades reintroduce neo-classic formalism in a major

urban complex.

Why this recurrent fervour for formalism? Is it, to recall Mies's phrase, that the need 'to create order out of the desperate confusion of our time' seems even more desperate in the United States than elsewhere? Is it the longing for historical association which must necessarily be built into the present and, for Greek revival and Beaux Arts classicism at least, a provincial exaggeration of the correct and chaste? Or is it, as Hitchcock suggests with reference to Beaux Arts academicism, that the impersonal nature of the large office coupled with drastic time limits on design, requires ready-made guarantees of architectural dignity? The generalized nature of classicistic schemes permits universal envelopes for function, so that there need be minimal rethinking of particular forms for particular functions from job to job. Moreover, the aura of humanism clinging to classicistic forms automatically dilutes the sense of impersonality in the completed building, while their elementary nature simultaneously accords with the anonymous process 3 which brought the building into being.

Architecture Nineteenth and Twentieth Centuries (Pelican History of

Whatever the causes of the specifically American fervour for classicistic formalism in the past, present conditions, especially in the United States but generally apparent throughout the world, encourage formalism in modern architecture. It is not so much that a full-blown 'movement' has gotten underway, as that a number of the most creative American architects have drifted toward a classicistic formalism, whether casual or convinced, whether temporary or permanent. Three developments, acting together, account for this emergent trend: technological innovations, a revived interest in ornament and a reawakened

sense of history.

The technological innovations are most apparent in the metal and glass office building, and in the Seagram building Mies and Philip Johnson achieved a climactic masterpiece in the new formalism. This is no place to dwell on the well-known story of the metal and glass skyscraper in post-war American building. Suffice it merely to say that although metal and glass buildings look very efficient—a visual fact which has accounted in part for their success—there has probably never been a popular style inherently more antifunctional. Here, surely, is a prime example of the inversion of Sullivan's famous slogan. Here function follows form. Pioneer glass walls were thermally impracticable. They filled rooms with glare. They leaked as wind drove rain through joints inadequately sealed. Only the labours of an army of technicians and the proliferation of compensating mechanical equipment have made the metal and glass image viable.

This increasing burden of mechanical equipment has encouraged an even more abstract approach to an essentially abstract concept. With air conditioning and luminous ceilings, it was no longer necessary, except for psychological reasons, to place shallow office spaces close to window areas. The slab building, which was the type of massing most favoured for bureaucratic structures in the first phase of the modern movement, begins to give way to fatter massing. Specifically, the massing of the RCA Building metamorphoses into the post-war additions to Rockefeller Centre (like the Esso Building, 3); the United





8, the Esso Building, New York, by Carson and Lundin, 1947: a post-war addition to Rockefeller Centre. 4, the Seagram Building, by Mies van der Rohe and Philip Johnson, 1958.

Nations Secretariat and Lever House into the Seagram, 4. Moreover, as business becomes increasingly mechanized, the architect can use the centres of deep space for machinery. Fully developed, the mechanized administrative complex follows the lead of the assem-



 Connecticut General Life Insurance offices at Hartford, Connecticut, by Skidmore, Owings and Merrill.

bly line. It is housed in low, sprawling structures, ideally surrounded by landscape (and of course parking lots). Thus Skidmore, Owings and Merrill's lavishly austere complex for the Connecticut General Life Insurance Company near Hartford, Connecticut, 5, is a prototype as significant for the mechanized bureaucracy as the same firm's Lever House was for the first phase of metal and glass office design. The architect becomes steadily freer in the disposition and extent of his homogenized space—as homogenized in the even tension of its gridded articulation and its ideal illumination as a Renaissance perspective.

While technology has worked to make generalized space synonymous with functional space, it has also progressively refined and polished the materials going into metal and glass construction. The primitivistic machine image which comprised Le Corbusier's point of departure in the twenties has been submerged by the triumph of Mies's vision of the elegance of the machine—another reason for Mies's phenomenal American success, since the refinement of components for mass production and their subsequent assemblage is profoundly congenial to American technology.

The simple massing with its linear articulation, the homogenized space linearly articulated too and the sumptuous materials elegantly detailed, inevitably led a classicistic architect like Mies toward the axiality and hierarchical frontality of the Seagram. Thus he climaxed a neo-Renaissance development in his work which had first markedly appeared in the Farnsworth House. From this house, neo-Renaissance formality began to influence modern American architecture.

The modern movement was ready for history. The polemical days of the blatantly contemporary were over. In the polar opposition between the Miesian appeal to an urbane tradition and the Corbusian appeal to primitivism, the American choice was obvious. Massing reminiscent of palazzo and temple forms has already emerged as among the most interesting and influential American types in recent

building—and to a degree which is uniquely American. Apart from the Lincoln Centre for the Performing Arts, consider, for example, Philip Johnson's Temple Kneses Tifereth Israel in Portchester, NY, 9, Edward Stone's Embassy in New Delhi, 10 and 11, Gordon Bunshaft's design² for the Skidmore, Owings and Merrill project for the Banque Lambert in Brussels, 8, Minoru Yamasaki's various pavilions, 12 and 13 on page 165, and, finally-just to stop somewhere-the block which houses the visual arts in Paul Rudolph's tripartite complex for the Jewett Arts Centre at Wellesley College, near Boston, 14 and 15. All of these are temple forms, save for the project for the Banque Lambert which recalls a palazzo. There is good reason for the popularity of these types at the present time. The sense of closure in such schemes indicates a reaction against the mass produced curtain wall, too often sliced like so much bologna, until the client has either had his fill or reached the limit of his pocketbook.

Beginning, middle and end: the self-contained entity has been a perennial prerequisite of art. Modern architectural massing, however, has up to now largely ignored this ancient formula of which Beaux Arts composition made a fetish. Instead of framing their masses in the Beaux Arts manner, modern architects had sought a tenser, more dynamic composition by using open, or at least unframed, forms and 'closing' these by optical activity (usually by asymmetrically placed voids) within the mass itself. Now interest in the base of the building, its roofline and its corners returns, varying in intensity with different architects, but evident as a trend. Enframement, thus far at least, is rarely complete. Corners especially seem more resistant to closure than roof and floor, thereby testifying to the tyranny of modular articulation for the wall, although the strongly bounded corners of the Seagram Building are certainly a bellwether of the future. Moreover, even if corners are open, the compactness and careful proportioning of the block can suggest a closed composition, and particularly where they are readily related to a central axis. Finally, a growing preference for weighty, static effects in place of the poised dynamics of the first phase of modern architecture completes the roster of effects congenial to neo-classic massing.

If massing conjures the past, so does the wall. Thin, planar surfaces are disappearing in favour of the stereometric wall, often ornamented. The reticulation of the metal and glass wall prepared the way for stereotomy which the growing popularity of cast stone seems about to consummate. Cast stone not only revives the classic masonry tradition, but has also provided some of the most creative ornament in recent American buildings. It may appear as slabs slotted with coloured glass, as in Johnson's KTI Synagogue. It may appear as pierced screens, as in Stone's Embassy, with its simultaneous evocation of Indian stone lattices and Perret's Notre Dame at Raincy. It may appear as a structural outrigging, as in Bunshaft's project for the Banque Lambert, which heralds a series of similar Skidmore, Owings and Merrill designs in what is a handsome new departure for the firm. It may appear as expressionistic structural decoration

³ With Project Manager Frederick C. Gans and Design Assistant Whitson M. Overcash, Jr.

as in Yamasaki's McGregor Conference Centre for Wayne State University in Detroit. Metal, too, begins to lose its linear and planar austerity. Thus Yamasaki creates a textile surround of overlapping circles cut from aluminium pipe to screen his Reynolds Aluminium Building, also in Detroit. Rudolph in the Jewett Arts Centre projects panels of metal mesh as a baffle between inside and out.

This decorative use of materials does more than enrich the building. It also provides a means by which the designer can reassert his individuality against the austerity of Miesian æsthetics, even as the overall massing recalls a classicistic universality. Thus these buildings reconcile individuality and correctness. And is this not the Beaux Arts reconciliation? But the ornament often serves another function. It may mask the skeletal construction which characterizes many of these buildings. A three- or even possibly a fourstorey building can be so screened that the skeletal nature of its framing disappears. The skeleton is transformed into a block, as in the Banque Lambert. It becomes a temple block if columns are placed outside the screen, as in the Delhi Embassy; or if the veil is lifted just enough to reveal the vertical supports of the framing while obscuring the horizontal edges of its floors, as in Rudolph's Arts Centre.

Thus the abstract quality of the Miesian metal and glass æsthetic becomes steadily more so. To simplify, and ignore an absolute chronology in favour of the general development: the first stage was an exteriorized æsthetic which gridded simple rectangular containers, and incidentally established the basis of the stereometric wall. The second was the perfection of mechanical equipment which enabled bulk space to be functional. The third was the conscious appeal to Renaissance axial and symmetrical organization. The fourth is the transformation of the Miesian æsthetic by elements which deliberately confuse toward the ends of decorative enrichment and formal organization. Thus the potentiality for abstractness seems to burgeon in current production in opposition to the functionalism (real or polemical) traditional to modern

This ambiguity implies mannerism in some formalist buildings, just as the collision of functional and formal elements in the same building tends toward mannerist tension. In Rudolph's Arts Centre, for example, just where is the plane of the wall? At the screens? At the glass behind? At the glass of the main floor which is inset behind the columns, instead of in front as is true for the upper storeys? Or at the shadows of the screens in the glass? Such ambiguous layering of the wall recalls Palladio's ambiguous treatment of the Palazzo Valmarana in Vicenza, 16, where, again, the eye shuffles the planes as one might shuffle a deck of cards. Nor does the mannerism of Rudolph's building end with the screens. Although there is not space to go into detail here, fire stairs, for emergency exit only, somewhat compete with the regular entrance for our attention outside. Inside, we climb a monumental stairway to a vestibule-like gallery, only to discover that the expected climax trickles away into work-aday cubicles. Three identical doors side by side at the end of a corridor lead to three different destinations. Space is bridged and stairs are hung as free-standing

entities; but walls crowd in to negate the freedom.

There is likewise a major ambiguity in Stone's handsome Embassy, the first modern federal building of consequence. It is appropriately formal and yet exotic, as much of the new formalism seems to be. And—a welcome quality of the movement—it adapts its modernity to native architecture, just as Rudolph's Arts Centre adopts the scale and some of the angularity of its collegiate gothic environment. The unsuspected element from the exterior is the interior. Elegant, and doubtless a very comfortable place in which to work; but we cannot erase the discordant sense that we have entered a temple to find an

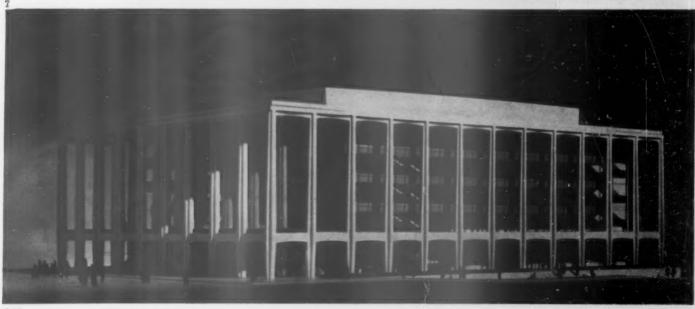
extraordinarily luxurious motel.

Or consider, finally, Yamasaki's McGregor Conference Centre, 12, so jewel-like it appears a little unreal. Its unreality is increased by the water garden, beautiful in itself, but precious in its sunken isolation and somewhat artificial in the context of a mid-western university campus. Mannerist formalism appears in the barricade of the entrance toward the garden by the terrace balustrading. From a three-quarters view at one side of the building, an element of mannerist instability appears in the open (or windowed side) of the building being functionally closed, while the closed end walls are extravagantly open. Mannerist also is the way in which the entrance splits the building so that we see it now as a single structure, again as two. The central space inside is tall and narrow with attenuated elements increasing its apparent height. Elongated doors, wiredrawn railings, thin structural members: this attenuation characterizes the three buildings we have looked at. Here the attenuation is emphasized by the denseness of the columns and the faceting overhead which constantly draws our eyes upward so as to maximize the vertical dimension. More than the other two buildings, Yamasaki's pavilion exploits structure for decoration in an ingenious manner, to create such intricate faceting overhead that we instinctively wonder whether the structure was not forced to its ornament rather than the reverse.

Now I have raised certain questions about these three buildings because they are outstanding among recent production. All have already proved influential, explicitly for the specific visual ideas which they embody, implicitly for the general philosophy which informed their design. Hence all are genuinely creative. All reassert the individuality of the designer against forces which would relegate him to anonymity. All flatter their clients, as well as their architects, since all are 'architecture,' not just 'buildings,' and hence all are affirmations toward a civilized society. All attempt to enlarge the architectural experience beyond the thin appeal of what is narrowly functional and shrilly up to date. Indeed, some of the restlessness felt within the serenity of the overall conceptions stems from the attempt to crowd too many different kinds of experience into the building fabric. The look to the future, the look to the past; the look to the western tradition and to the east simultaneously; the look to structure, but not forgetting ornament; the sense of tension and surprise amidst serenity. This eclectic heaping of interests and experiences signifies a moment of taking stock in a self-conscious fashion

Model showing the final design for the Philharmonic Hall now under construction as the first stage of the Lincoln Centre for the Performing Arts, at the intersection of Broadway and Columbus Avenue, and Columbus Avenue, New York City; architects, Harrison and Abramovitz. 6, detail of one corner, showing the 70 ft. masonry-clad columns that surround the exterior. Through the glazed wall can be seen the glazed wall can be seen the foyer and the terraces sur-rounding the auditorium. The auditorium, seating 2,400, will provide a new home for the New York Philharmonic Orchestra. 7, the symmetrical south façade of the building fac-ing the central plaza which will be flanked by the other principal buildings of the Centre: a theatre (architect, Philip Johnson) and an opera-house. There will also be a dance-theatre and a library and museum. The Philharmonic Hall is due for completion by the autumn of next year.





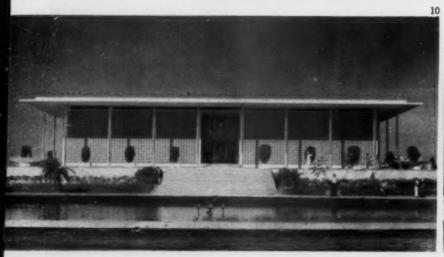
8, model of the design (by Gordon Bunshaft of Skidmore, Owings and Merrill) for the Banque Lambert at Brussels, illustrating (together with the other examples on this page and page 165) the formalist trend in American architecture.

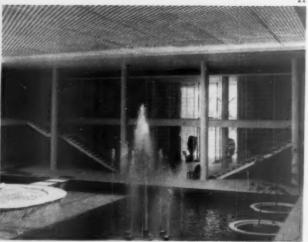


9, Philip Johnson's synagogue at Portchester, NY (Temple Kneses Tifereth Israel), 1957.



Below, the new US Embassy at Delhi, by EdwardD.Stone, 1958. 10, the exterior; 11, internal covered court, with pool and fountains.





—a moment of mannerist hesitancy and tremendous absorption, before reaching out more decisively.

But the worry remains. It is not that the buildings are abstract. We are too sophisticated now to demand naked functionalism at all costs. Nor is it that the buildings look to the historical past. We welcome the denser experience which history promises. The danger is simply that these buildings augur an increasing abstractness and historicism in much of modern architecture, such that it may quite literally cease to be modern in the sense that its imagery grows

from the urgency of modern life.

This is the strength of the three great form-givers of the modern movement. To be sure, they have created exciting buildings, and have originated three kinds of space. But each has also possessed a large philosophy of modern life, and each created his building images out of this philosophy. Wright, Mies and Le Corbusier (Gropius too) had quite literally to fashion a modern world in terms of which they could build. Hence we see their buildings not only as formal entities, but as extensions of their philosophies, as images of what they conceived the specifically modern experience to be: the organic image, the structural image, the machine image (not identical with the structural image, however closely the two are allied) and the primitive image. If they gave (and still give) us their buildings, a major part of their heritage to the present is also the gift of their worlds.

Certainly, too few architects now in the prime of their practice have felt the need to tussle with the problem of the nature of the specifically 'modern' experience as the means toward a philosophy of expression. There is something Jovian in Mies's return from a lifelong quest of the modern to re-do the academic. But it is a different matter altogether to start with the Seagram and re-do McKim, Mead and White's Racquet Club across the street in plate glass and precast concrete. In short, the worry is that, with acceptance, the modern movement will academically pursue the cult of beautiful buildings, as Robin Boyd has recently emphasized³. Making modern architecture beautiful will predominate over making

beautiful modern architecture.

I do not mean to suggest that either the architects whom I have mentioned or their buildings are academic. The architects in question have only touched on the point where academicism becomes an issue for modern architecture as a whole, not necessarily a reality within their own work. Rudolph, for one, has already radically shifted his architectural philosophy from the position represented by the Jewett Arts Centre, while certain elements like the run of the screens beyond the building corners and the jagged roof silhouette point to a more boldly open and plastic image4. Philip Johnson, for another, although the profoundest neo-classicist of all, is enveloping spaces in such a variety of large, simple, compact shapes that the image impact of the shape may predominate in some of his works now under way, as the rather too specific recall of the classicistic tradition promises to appear in others. Moreover, all five of the

architects mentioned arrive at their formalism with such an arsenal of visual ideas at their command that it would be presumptuous to suppose that their future course is set. At this moment, in fact, in modern American architecture certain interests attracting the most creative architect happen to coincide with those which will make others academic. Although the situation is not precisely analogous to that at the turn of the century (for reasons which cannot be investigated here), it is nevertheless tempting to parallel present circumstances with the cleavage represented by McKim, Mead and White, on the one hand, and early Wright, on the other. Early Wright is perhaps more to the point than late Mies to demonstrate that academic formalism can itself play a creative role in future developments. He used Beaux Arts massing as a means of disciplining his early work. The Renaissance elements in the massing of Sullivan's skyscrapers are another case in point.

By way of underscoring this last equivocation, it is only fair to glance once more at some of our examples in order to indicate what does seem valid in this formalism. The exterior of Stone's Embassy is dignified without being forbidding; its screening is at once handsome, functional and (unlike certain of Stone's later buildings) articulated by the structural columns. The super-position of the Indian screens on the Lincoln Memorial—which Stone now says he admires and, up to a point at least, so now do many—is a dangerously literal use of past symbols to be sure. But the amalgamation of the two traditions and the successful adjustment of their differences in a convincing synthesis appropriate to this particular programme is admirable. As a result, the exterior possesses the authenticity of this appropriateness and the excitement of discovery, before the discovery has

become formularized.

Just so with the Skidmore, Owings and Merrill design for the Banque Lambert. The simple forms of its neighbouring eighteenth-century structures, their weight, the scale of their windows and their tendency toward symmetrical organization appear in the bank. The bank compliments and completes the square which it dominates in a manner which is perfectly consonant with the structural, functional and expressive qualities of a modern building. Finally, Johnson's Synagogue, which is perhaps as important as the Seagram Building as a herald of formalistic discipline: here, the slabs may seem so ironed and dazzlingly white in the apparent attempt to dematerialize the building into a pristine, and therefore spiritualized, geometry that it becomes, like Yamasaki's Conference Centre, somewhat unreal. (Certainly, too, some of the interior furnishing lacks suitable austerity, which is not entirely the architect's fault.) But the ceremonial conception is magnificent, and the basic forms are justified by the conception. We move axially through the domed vestibule and into the lofty, beautifully proportioned space, its walls splintered with coloured light, its ceiling billowed with plaster handkerchief vaults lightly caught at the corners in a manner reminiscent of Sir John Soane. The purity of this ceremony in its simplicity is far more transcendent than the lugubrious expressionism of the average modern synagogue.

³ Architectural Forum (July, 1959), pp. 98-103.

⁴ As G. M. Kallmann has pointed out in 'Action Architecture,' Architectural Forum (October, 1959), pp. 182–187.

In each of these three instances the formality and much of the refinement seems justified with reference to the significant human experience which called it into being. But, in each instance, how easily the manner can be frozen once the particular experience has fled! Such forms are so generalized and so suave that they are readily refined from the realm of experience to that of mere appropriateness. As Louis Kahn, whose teaching and philosophy are among the most stimulating to those among the emerging generation of architects in search for a rationalized version of Le Corbusier's highly personal plasticity, protested recently: 'Here the modern movement is only thirty years old, and we are already polishing and perfecting it. We should be in the archaic phase. Our buildings should reflect this crudeness.' Being the architect he is, Kahn happens to emphasize the quality of crudeness in his distrust of the sleekness which the American situation tends to impose on architecture, much as Pollock, Kline and de Kooning represent the same protest in painting, and the Beatniks in writing. It is Kahn's sentiment I would emphasize here, not necessarily his own creative action on this sentiment. For those who boggle at the quality of crudeness as an unreal goal in a highly developed technology-and, in any case, the precast structural elements in Kahn's latest work are far from Chandigarh crudity in both their perfection of fit and surface—alter a word and the essence of the statement remains. 'We should be in the archaic phase. Our building should reflect this search.' After all, Mies has repeatedly said the same. 'Form is not the aim of our work, but only the result. . . . Architecture is the will of an epoch translated into space; living, changing, new'5.

^a The emphasis on space is characteristic of the first phase of the modern movement. Most architects would say 'space and mass' today.

16, Palladio's Palazzo Valmarana at Vicenza, the ambiguous layering of whose walls, typical of Mannerist architecture, is echoed in Paul Rudolph's Jewett Arts Centre, 14 and 15 opposite.



Certain it is that the simple functional and structural logic of the pioneer phase of modern architectural theory has become paradoxical. During the first phase of the modern movement, function and structure provided a discipline within which the architect could work to create buildings which were meaningfully modern. But the most abstract buildings can now be functional. Those which are self-consciously structural can be the most fantastic. Where the range for individual design is so great, the temptation toward abstraction and novelty is considerable. It will be all the more important, therefore, to root architecture in human experience. But any building can be somehow rationalized in terms of human experience, and none more readily than those rationalized in terms of a nexus of function, novelty and tradition. It works: it's new; it's sanctioned: how convincing such justification! And how salutary all of these characteristics!

In absolute terms, however, the most significant architecture of our time possesses something beyond this nexus of valued, but secondary, characteristics. The true successors of the great pioneers must also create within the larger framework of some world of their own which, nevertheless, taps something vital in modern experience and makes tangible the 'will of the epoch.' What is lacking today is the spirit which produced In the Cause of Architecture, Vers une Architecture, the Bauhaus books or the magazines di Stijl and G. Perhaps inevitably so, although there are already abundant signs of revolt, in part toward a more deliberate use of mannerist elements for positive æsthetic effects and even proto-baroque indications of an eventual reconciliation of mannerist tensions, but especially against the formalist threat.

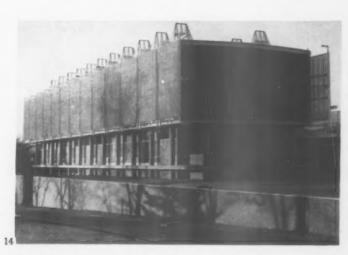
What Reyner Banham termed New Brutalism several years ago, for example, G. M. Kallmann has recently more comprehensively analysed as Action Architecture⁶. Such avant gardes will gain recruits. But so will the new formalism. For the immediate future at least, it may have the upper hand, even if, in the long run, it does not seem likely that neoclassicism can again play the same central role as it did at the turn of the century. It even promises a few masterpieces. In so far as one can judge from the model, the Lincoln Centre for the Performing Arts may well be one of them, much as McKim, Mead and White's Boston Public Library is among the triumphs of late nineteenth-century American architecture. Only when we measure the Public Library against such near contemporaries as Richardson's Marshall Field Wholesale Store, Root's Monadnock Building or Sullivan's skyscrapers do we have reservations. Ultimately the urgency of the conception counts most.

^{6 &#}x27;The New Brutalism,' Architectural Review (December, 1955), pp. 355-361. For Kallmann see footnote page 163. Thomas Creighton, 'The New Sensualism,' Progressive Architecture (September, October, 1959), pp. 141-147 and 180-187, furnishes yet another sobriquet which, however, gathers formalists with their opponents.

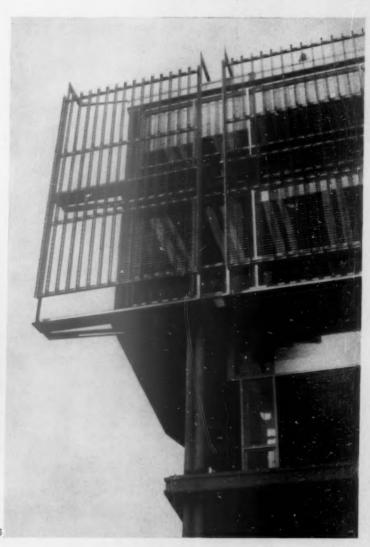




Recent instances of the formalist trend in American architecture. Above, two 'pavilion' buildings by Minoru Yamasaki. 12, the McGregor Memorial Community Conference Centre, for Wayne State University, Detroit, 1958. Triangular box-beams of concrete are supported on marble-clad steel columns. 13, office building (also at Detroit) for the Reynolds Metal Company, 1959, faced above the first floor with aluminium screening.



The Jewett Arts Centre for Wellesley College, near Boston, Mass., by Paul Rudolph, 1959. 14, the art building facing the older university campus—a reinforced concrete structure with brick and stone walling. 15, detail of a corner of the building, showing the aluminium screen set forward of the structural frame.



15

offices, wartebone road, bondon

ARCHITECTS

GOLLINS, MELVIN, WARD AND PARTNERS assistants: A. J. Hoffman; H. Prime; T. Stutely



An office block, known as Castrol House, nearly opposite St. Marylebone Town Hall, erected by the Hammerson Group of Companies and rented by C. C. Wakefield and Co. The preliminary plans for the building, establishing the principle of a tower block rising from a low podium, were prepared by Sir Hugh Casson and Neville Conder. At this stage, by agreement with the clients, the project was entrusted to Messrs. Gollins, Melvin, Ward and Partners. It was a condition imposed by the groundlandlords that the whole area of the site should be built on. The building consists of a 13-storey tower springing from the roof of a two-storey block, with a set-back third storey on the roof of the latter, alongside the tower but detached from it. It was originally hoped that the tower block could have been at least four storeys higher, which would have allowed the omission of the second floor to the low block while preserving the same site coverage, but negotiations with the planning authority produced the present scheme. The low block surrounds two internal courts. The basement contains a garage.

The ground floor beneath the tower is largely given over to an entrance hall, separated from the street only by a glazed wall, from which a free-standing staircase leads to an upper hall designed for exhibitions and displays. The wall on the far side from the entrance is covered by a cast aluminium relief sculpture by Geoffrey Clarke, 50ft. long and rising 24ft. to the ceiling of the upper hall. A third side of the entrance hall provides the connection to the two-storey block, and on the fourth side are the lifts and escape-stairs. These rise into the corner of the tower, leaving an L-shaped area on each floor for sub-division as offices. On several of the upper floors are specially designed receptionsuites, board-rooms, etc. A circular staircase from a lounge on the top floor gives access to the roof. The top floor of the low block contains visitors' bedrooms and lounges and a caretaker's flat.

To allow flexibility in internal planning and in the running of services, a flat slab structural system was adopted. A series of beam strips, approximately 6ft. wide, span between columns within the depth of the floor-slab (a system that also saves concrete form-work). Columns are standardized in three basic sizes: 30in. square in the basement, ground and first floors of the tower-block, 24in. square in the next four floors of the tower-block, and 21in, square in the upper part of the tower-block and throughout the two-storey block. Items like column-caps and staircase flights were designed for precasting in most cases. Lift enclosures and fire-break walls were incorporated in the structural design to give rigidity. For the same purpose the tower-block has two continuous reinforced-concrete diaphragm walls, visible on the upper floors. They are 12in, thick and are taken right down to the main foundations.



The whole building is enclosed within an aluminium curtain-wall. In the low block this is based on a 7ft. 9in. module, divided in two for partitioning; in the tower the module is 4ft. In the low block the curtain-wall consists of black anodized mullions at approximately 8ft. centres, connected by deep transomes, cills, etc. (anodized natural finish). The window inserts are mainly horizontal sliding sashes. The spandrel panel inserts on the three main elevations are white Sicilian marble: on the fourth they are glass.

The curtain-walling to the tower consists of a deep anodized aluminium grid of mullions, cills, etc., with sliding sash inserts with a black anodized finish and spandrel panels of green glass. Floodlighting behind the panels gives an external effect at night of a series of illuminated trays. The artificial light throughout is by cold cathode, automatically controlled by photo-electric cells according to the daylight factor.

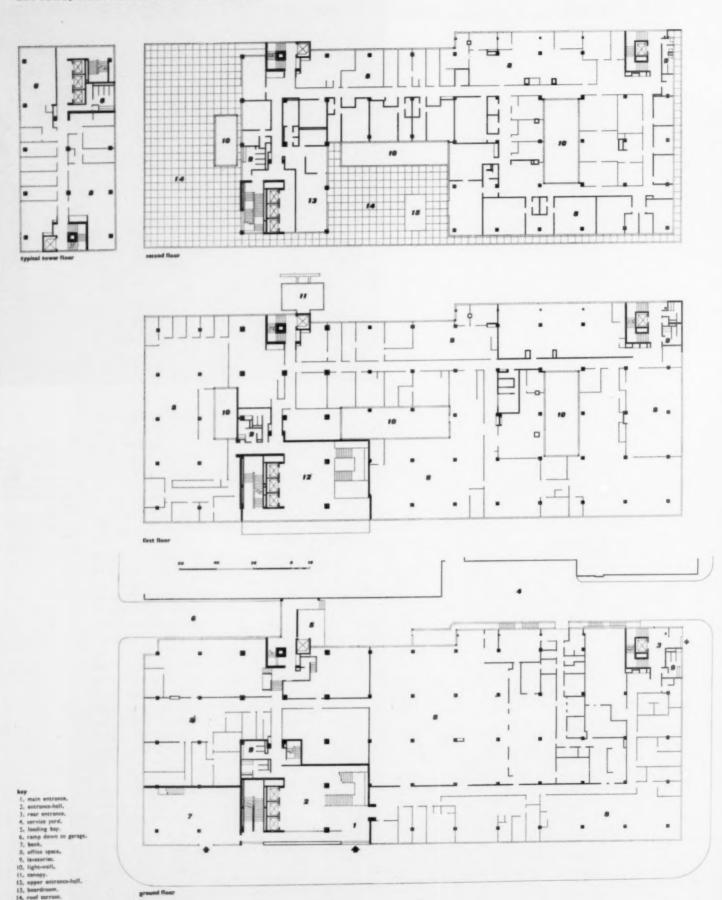
Space-heating (from three oil-fired boilers) is by means of tubes suspended beneath the floor-slabs within the depth of the suspended ceilings. These ceilings are of perforated aluminium demountable panels of a type produced in Denmark. Only the basement garage, the internal lavatories, the kitchens and a cinema have mechanical ventilation. The plant for this is in a subbasement. There is a Lamson postal tube delivery to all departments.

The external walls of the tower-block will be cleaned from electrically controlled gondolas suspended from a cantilever cradle trolley running on tracks round the roof. The two-storey block will be cleaned on three elevations directly from a similar trolley and on the rear elevation from a cradle suspended as in the case of the tower block, because ramps, loading-bays, etc., would obstruct the passage of a trolley.

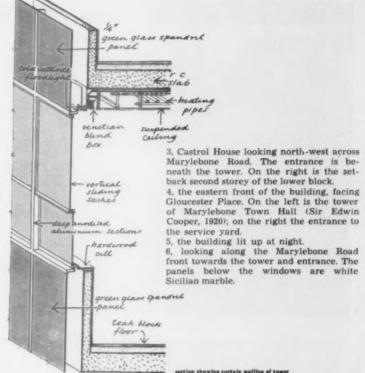
1 (facing page), Castrol House from the top of Montagu Street. looking north-east across Marylebone (above) the

tower rising above houses Dorset Square.

OFFICES, MARYLEBONE ROAD, LONDON



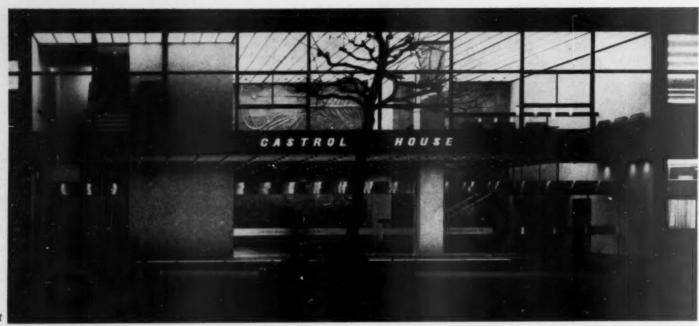








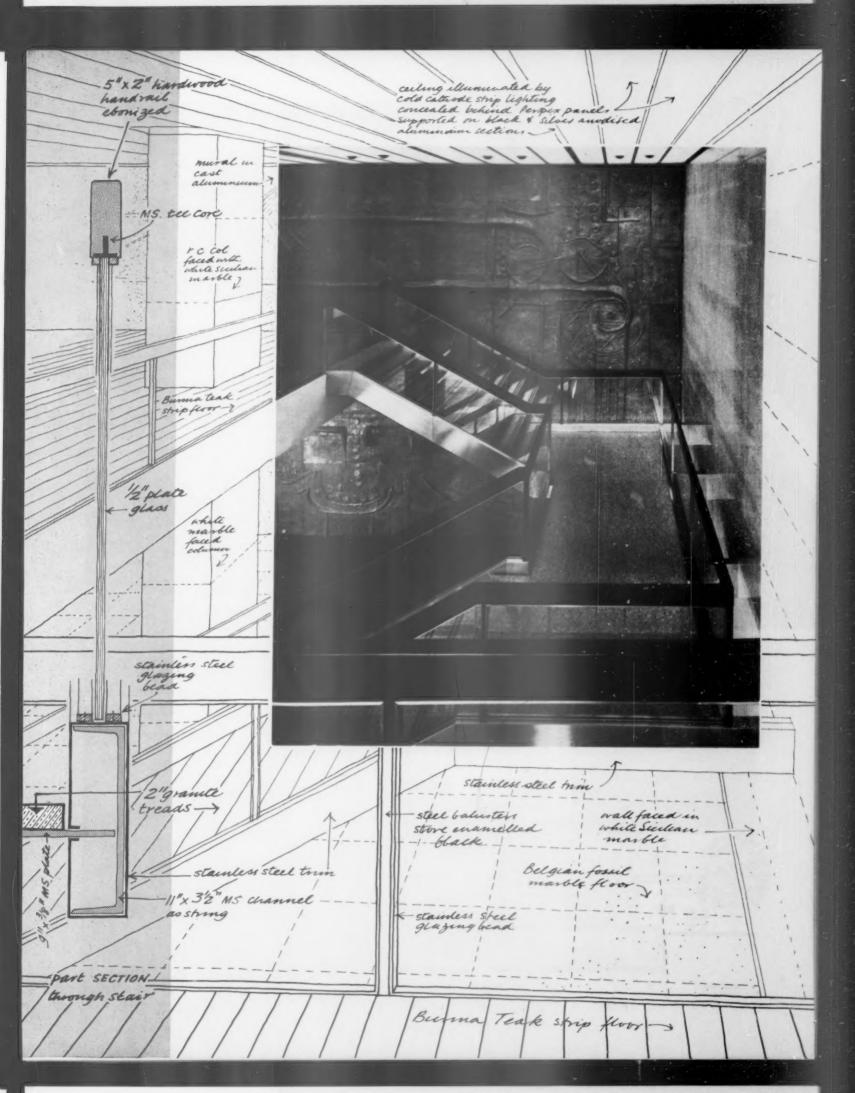




OFFICES, MARYLEBONE ROAD, LONDON

7, close-up of entrance, taken at night with the two-level hall illuminated. 8, inside the entrance-hall, looking east towards the staircase leading to the upper hall (see detail opposite). On the left is the cast aluminium sculpture by Geoffrey Clarke (see also cover). Facing page, the free-standing staircase.





OFFIGES, MARYLEBONE ROAD, LONDON 10, looking west at first-floor level, show-

10, looking west at first-floor level, showing roof terrace continuing beneath overhang of tower and, on the right, the setback second storey. The uprights of the handrail are extensions of the black anodized mullions of the curtain-wall enclosing the storeys beneath.

11 (bottom right), night view of the main entrance in Marylebone Road, showing illuminated step and the glass front-wall of the entrance-hall, through which can be seen the corner of the staircase illustrated on the preceding page. The recessed entrance is lined with Sicilian marble except on the left where the pier is faced with variegated orange-coloured mosaic, which continues into the hall and round the lift doors. The soffit is a Danish type of aluminium strip.

asphalt

asphalt

asphalt

asphalt

asphalt

beach Socion

marking Spanishil

panel

preceding

recessed
lined with

marble ex
the left

pier is

the varie
ange-col
aic, which
into the

The soffit

thype of

strip.

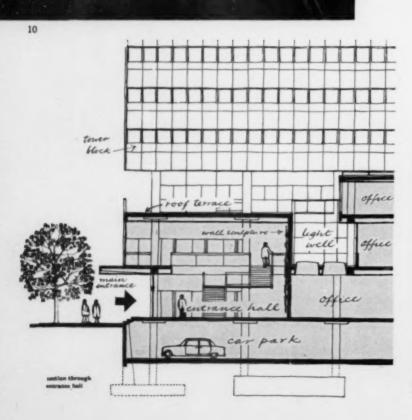
Asmiguntal

slining curtain

and canopy

T. C.

Canopy





11

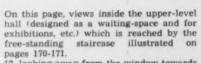
172











pages 170-171.

12, looking away from the window towards the back wall, showing the upper part of the Geoffrey Clarke cast aluminium sculpture, which extends downwards to ground level (see page 170 and cover). The ceiling panels, illuminated from above, are of corrugated transparent plastic. The tables have black plastic tops. The floor is of Burma teak strips.

13, the window wall, overlooking Marylebone Road.

14. looking towards the lift doors, which

bone Road.

14, looking towards the lift doors, which are surrounded by variegated orange mosaic and separated by panels of ribbed aluminium. The upholstery is black leather.

15, looking outwards towards Marylebone Town Hall on the other side of the road. 16, south-east corner of upper hall with staircase balustrade.





17

OFFICES, MARYLEBONE ROAD, LONDON

17, the boardroom on the second floor. Wall-panelling is natural leather, carpet dark blue and curtains oatmeal colour.

18, on a typical office floor, showing the removable partitioning system used throughout the building to subdivide the open office areas. The framing is an extruded aluminium section and the solid panels plastic-faced vermiculite. The continuous ceiling (above which all services are run) is a Danish type of perforated aluminium strip.



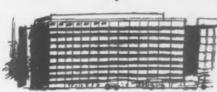
Kenneth Browne

HIGH LONDON

A study of tower buildings in relation to the townscape

During the next ten years the familiar skyline of London will be completely changed by high building. This change will be for the better only if there is a really imaginative town planning policy to control it; a policy which can state where high buildings should be encouraged and where disallowed.

Building high is inevitable and is the logical answer to the apparently inexhaustible demand for living and working space in central London; a demand which encourages developers to cram as much lettable space on to every site as they can, checked only by the relevant plot ratio laid down by the LCC. Simply stated, this means that where the ratio is high (e.g. 5:1 in the City) the developer has the alternative of either building ponderous cliff-like blocks say 100 ft. high



solid building

or towers twice as high rising from a base of lower buildings. Whichever he does he



will only be allowed the same amount of floor space, for higher building is not synonymous with higher density. Obviously the latter type of building is more likely to produce a human scale environment at street level and for this reason the LCC planners rightly encourage it wherever possible. In consequence they are likely to be inundated in the near future with applications to build high.

Now this raises a considerable problem, for the siting of really high buildings which are seen over a wide area, cannot just be left to chance. Has the LCC a policy? The exhibition at County Hall last December was presumably intended to show they had, but in fact showed nothing more positive than pious hopes and the assurance that high buildings would be well spaced out. It is true that they have a list of conditions which every new high block must satisfy but it is surely essential that they should have a

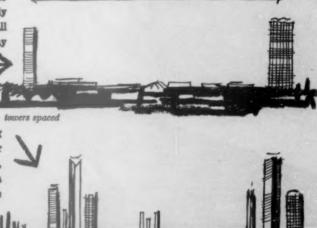
more creative policy on the question of siting. Merely deciding that they shall never be closer than say a quarter of a mile apart, is not enough.

It may be that groups of tall buildings of varying height with wide spacing between groups is a better solution. What is more, the council should form a policy now or they will be swamped by demands for tall buildings whilst having no overall pattern to which to relate

them.

However, when you get down to trying to work out a creative, rather than a merely restrictive, policy the difficulties become apparent. Where do you start? It is not enough to consider the effect of each building in isolation, for the relationship of high blocks will change constantly with the viewpoint and the screening effect of other buildings. To gauge the effect from every aspect is obviously impracticable. However, because some accidental effects, good and had, are inevitable, that is no reason for throwing in the sponge altogether. One answer surely is not to try to formulate a book of rules but examine particular cases.

Which are the London views that must on no account be accidentally spoilt? These should be listed, surveyed and then protected, not in a dull spirit of preservationism, but so that every new project is considered in relation to these points of view. They occur



4 MILE

towers grouped

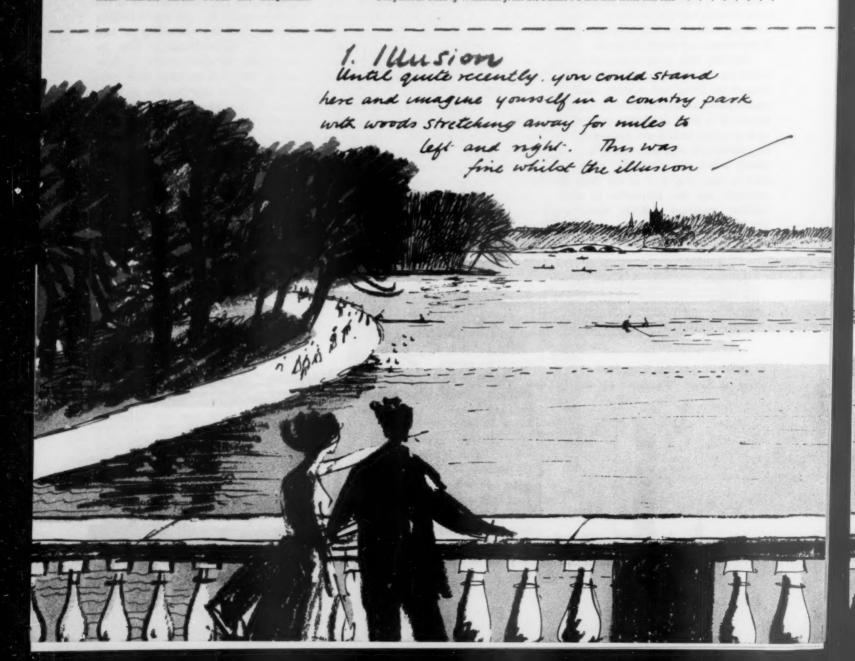
particularly in and around the royal parks and, being generally more distant views, are particularly vulnerable to badly placed high building. The amount of open space, the height and the proximity of trees will all affect this vulnerability. For example, St. James's Park is not so vulnerable as one might expect considering its small size, for the trees are thick and high and open spaces few. In consequence, the adjacent mass of Queen Anne's Mansions (180 ft.) is hardly noticed.

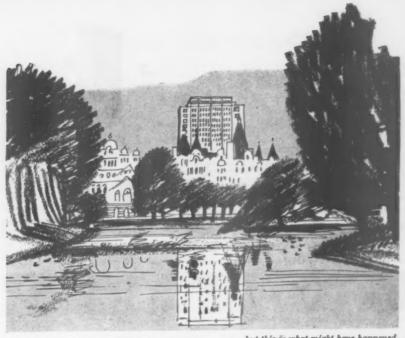
On the other hand, the world famous view of Whitehall reflected in the lake, right, could easily have been wrecked had the new Shell building (which is 351 ft. high but half a mile away) been sited slightly farther down river (see opposite). We may not be so lucky next time.

In Hyde Park vulnerable views occur all along the Serpentine and in the open area near Marble Arch. From the Serpentine



The famous vista of Whitehall from St. James's Park still looks like this



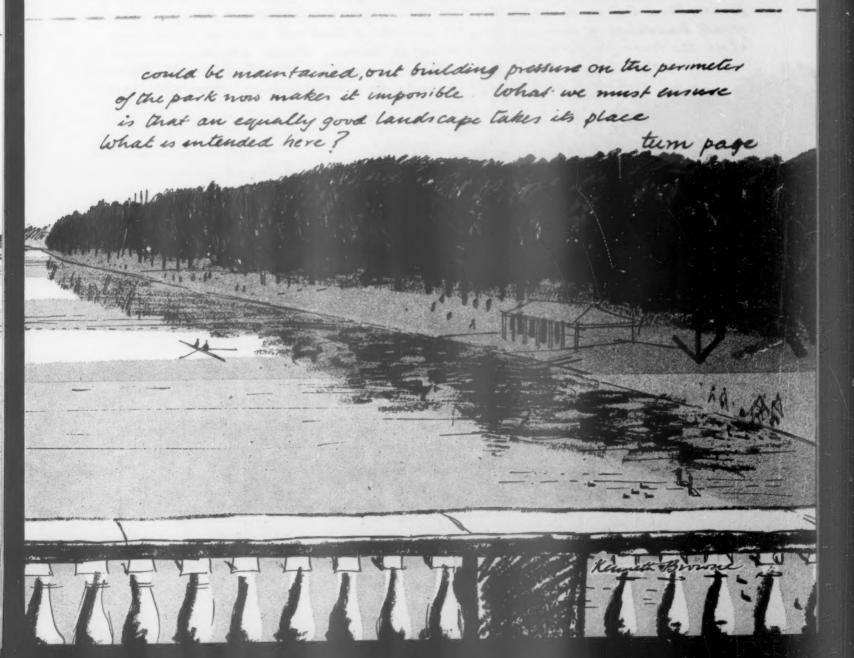


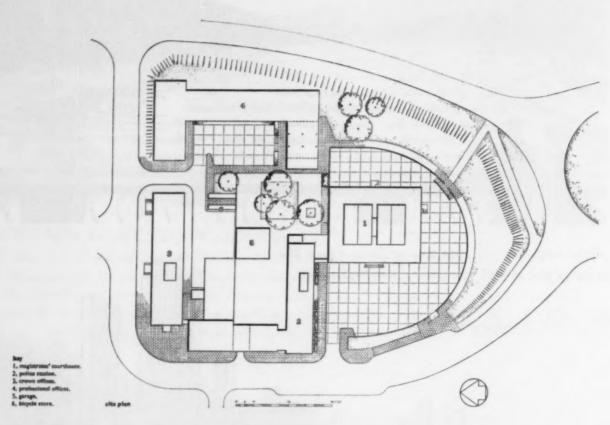
but this is what might have happened.

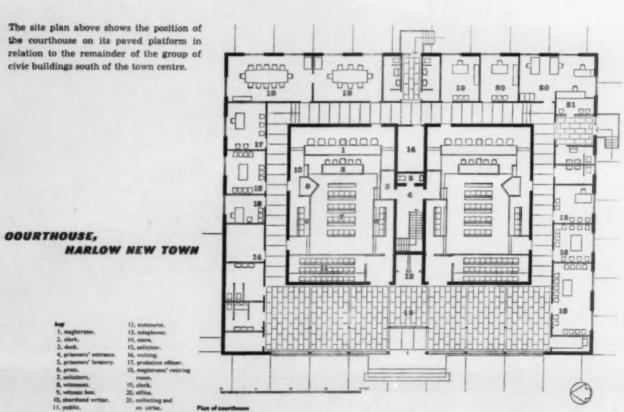
bridge itself looking north you can now see a high building (Elsom's Eastbourne Terrace tower, 170 ft.) which by accident makes a good focal point at the end of the Long



Water (though it is in fact half a mile beyond it). The view looking east from the same bridge (see below) is far more vulnerable. It is one of the most open views in Hyde Park and is also one of the best known vantage points with threequarters of a mile of lake stretching in front and wooded banks on either side. In the far distance you can see the Victoria Tower of the Houses of Parliament (340 ft.) over two miles away.







COURTHOUSE, HARLOW MAW TOWN

ARCHITEGT partner in charge

FREDERICK GIBBERD (in association with H. Gonolly, Essex County Architect)
G. T. Goalen

These Magistrates' Courts are on the south-east corner of the group of civic buildings that forms the southern boundary of the town centre, overlooking the landscape valley.* Other buildings with functional affinities, planned in relation to the courts, are the police-station. Crown offices and an office block for professional people.

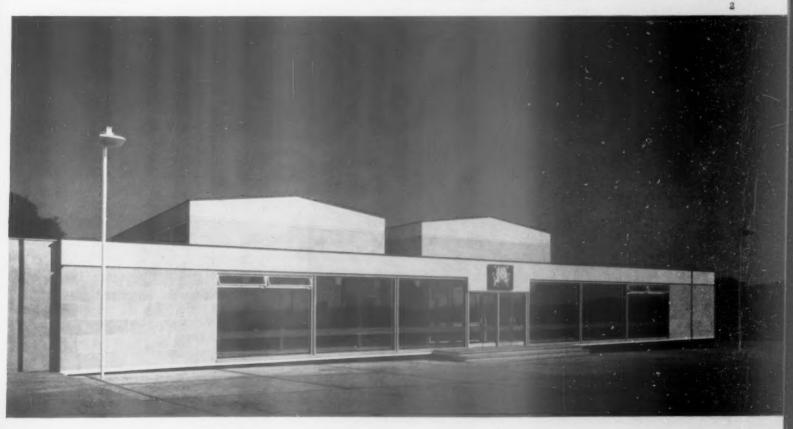
The site is a key one in the design of the town centre, as it lies at the foot of the roundabout where the main approach roads join the town centre roads—it marks one of the entrances to the town centre and is identifiable by traffic by-passing it. The office-type buildings are grouped tightly together around rectangular spaces, but the courts project towards the roundabout and the landscape as a free-standing composition, with the offices as their background. They stand on a semicircular concrete plateau above the level of the approach road and the landscape. The brick retaining wall to the plateau is designed to reflect the form of the roundabout while at the same time dissociating the building from passing traffic.





1 (above), the courthouse on its paved platform, showing the curved brick retaining-wall. On the left is the police-station; on the right the central landscaped wedge. 2, the west front, with the two courts rising behind the concourse. The royal cipher over the doors, designed by Walter Hoyle, is of cast aluminium.

The plan is a mirror symmetry in which a pair of identical Magistrates' Courts are surrounded on three sides by ancillary rooms and are united on the fourth by an entrance concourse. The building is one storey



(as part of the broken silhouette of the town centre) but the courts rise above the level of the surrounding rooms, to obtain clerestory lighting and to be visible externally. The two courts are separated from each other by a narrow gap in which is placed the prisoners' access stairs (connected to the police station by a tunnel), and the ventilation plant common to them both.

The entrance concourse stretches across the frontage of the building and has a glass external wall to unite it with the forecourt and to contrast with the solid forms of the rest of the building. The floor is in white marble and the courts themselves are expressed in the concourse by being faced in Hadene stone. A toplit corridor surrounds the courts, separating them from the offices and other small rooms on the flanks and from the magistrates' retiring rooms at the rear. Separate entrances are provided for the magistrates and the offices.

Construction is of load-bearing brick and concrete walls, as apart from being more economical than a frame, the mass of material assisted in sound insulation. The main external wall unit consists of brick piers and concrete blocks faced with grey Cornish granite alternating with metal windows under which are grey rendered block panel walls. The cornice is of concrete slab faced with crushed Derbyshire spar and mother-

of-pearl and has a thin slate coping. The roof of the courts consists of steel roof-trusses supporting a copper roof on boarding and timber joists, from which is suspended a perforated fibrous plaster ceiling backed with resin-bonded fibre-glass. The roofs to the lower buildings are timber, covered with asphalte on screed and woodwool slabs.

The gilded and painted royal ciphers over the entrance doors and the magistrates' desks were designed by Walter Hoyle; the external one is in cast aluminium and those to the courts are in carved linoleum. The fittings and furniture in the Courts were designed by the architect. The panelling generally is in teak veneered blockboard and the furniture is in afrormosia and blue-grey leather.



standardization in architectural circles—is an obstruction to total functional planning at the practical as well as the theoretical level.

Such an outcome was only to be expected. Throughout the present century architects have made fetishes of technological and scientific someones of context and been disappointed by them when they developed according to the processes of technical development, not according to the hopes of architects.

Reyner Banham stiders to the Machine Mark of the Reyner Banham stiders of the Machine South of the Computer, or Cybernatics editor

A. C. Brothers ENGLISH ELECTRIC M. E. Drummond IBM (UNITED KINGDOM)

R. Liewelyn-Davies THE NURFIELD FOUNDATION



THE SCIENCE SIDE

WEAPONS SYSTEMS COMPUTERS HUMAN SCIENCES



aretome ongineering

In February's 1960 article, Stocktaking, a firm line was drawn between the traditional and technological aspects of architecture. Leaving the line drawn for the moment, this month's papers examine the kind of information and mental techniques to be found on the solence side. The three main topics discussed have all been suggested by recent architectural writings or discussion as having something valid to say about architecture. The first, for instance, takes off from the increasingly widespread opinion that rocketry—because of its relative lack of financial restraints—has gone further into the fields of total planning and teamwork than architects have yet dared to dream. Has it, in the process, called in question any other dreams entertained about the technological world by architects? The answer appears to be that 'components off the peg'—a concept enjoying the reflected glamour of the mystique of

standardization in architectural circles—is an obstruction to total functional planning at the practical as well as the theoretical level.

Such an outcome was only to be expected. Throughout the present century architects have made fetishes of technological and scientific concepts out of context and been disappointed by them when they developed according to the processes of technical development, not according to the hopes of architects. A generation ago, it was 'The Machine' that let architects down-tomorrow or the day after it will be 'The Computer,' or Cybernetics or Topology.

A. C. Brothers

WEAPONS SYSTEMS

Until a few years ago aircraft and guided weapon designers relied on remarkably hit or miss ideas. They would design an excellent airframe which, if it was given an engine of a certain power, weight and size, would fly magnificently. But usually the engines which were available had been developed without any particular regard to any airframe which was on the drawing board at the time. The result was a compromise—the airframe was wedded to an engine which was either rather less, or a little more, powerful than the optimum one which the designer had envisaged, perhaps a little unrealistically, for his new machine. And probably it would not fit snugly into the nacelle of the airframe-it was too big or too small. So the wonderful airframe lost some of its efficiency. This was the beginning of a slow process which inevitably resulted in an indifferent aeroplane.

The air force would decide that four cannon and some rocket projectiles were needed. The cannon could be fitted into the wings if some of the fuel tankage was removed, and the rockets could be carried if the wings were strengthened a little and special attachments put on them. So there was more sacrifice-less fuel, a heavier wing and more aerodynamic drag! The situation could rather easily get out of hand, and that is what usually happened when aircraft, introduced in advance as wonderful by the publicists, later turned out to be failures.

systems engineering

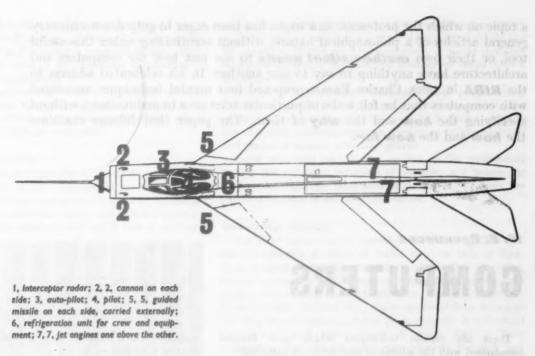
To get away from this danger, aircraft, engine and accessory

designers evolved the technique of systems engineering. Instead of designing a good basic aeroplane and then spoiling it by fitting it to do a job which was only vaguely in their minds when they conceived it, they decided to work backwards so to speak, and to agree first on the job which it would be expected to do when it reached the squadrons. It meant a complete re-thinking of the old design concepts. It was no longer good enough to take off-the-shelf items and find room for them in an aircraft; instead it had to be decided what items of equipment were necessary in a new aircraft before it was even designed, and to design them into it. The designer of a complete weapon-system (a term covering the actual aeroplane, its armament, radar instruments, crew, etc.) such as the Lightning interceptor which will soon enter service with the Royal Air Force, was faced with

this sort of complex question: how to provide a method of destroying any enemy bomber many miles from the coast in any weather, any season and by day or night. In the simplest terms the problem was to put an explosive charge into a position many miles from its point of launch, in a given time-which was inevitably short-and to ensure that it went off with enough force to kill the enemy. It was also essential to recover the carrier, under which name the aeroplane itself has become known, for further use. Every effort was directed to this one goal. There were to be no compromises, and the design team responsible now enumerated what equipment was needed for the weapon system they visualized.

First, a small, reliable guided missile was needed. It should have a fast flight speed, a simple accurate guidance arrangement and a powerful warhead. This was to be carried most of the way towards the enemy and then launched to home the last few miles by itself. Next a radar set was required to guide the aeroplane into the right position for launching the missile. It would have to be able to work at very high speed, be extremely accurate and foolproof and work as a partner to the missile. There needed to be an automatic pilot which would fly the aeroplane while the human pilot had his hands, eyes and ears fully occupied in monitoring the radar, missiles and information being radioed to him from the ground. There were several missiles, radars and auto-pilots available which might have done the job-more or less. But by installing any one of them the overall performance of the weapon-system would have been compromised. All those items which were on the shelf were rejected. New ones, it was decided, were needed, each tailored to fit, and work effectively with, the others and the actual aeroplane being planned to carry them. The airframe and its engines were similarly tailored to carry the equipment now being designed for it. This meant that the equipment had to be given at least equal consideration in the design stage with the aerodynamic and structural problems of the aeroplane itself. In this paper only three typical items are mentioned; there are, in fact, very many more including special instruments for the pilot's dashboard (not just the standard altimeter or airspeed indicator then available), many electronic and electrical





devices which are too numerous to mention, and even a refrigeration unit for cooling both the crew and some of the electronics.

All these items were designed and developed in parallel. Each firm involved in them kept in close touch with the chief designer's team and with each other. This prevented sub-contractors going off at a tangent in their work which might have made it easier for them to produce their particular item, but would have adversely affected the overall system, perhaps by being too large or maintaining its required performance only under some of the conditions in which the system as a whole had to function.

oarrier

Once it was decided what equipment was needed to make the weapon-system work and it was established that this could be developed in a realistic time-scale, the design of the carrier itself had to be completed. After an exhaustive investigation it was shown that the equipment could be packed into a long, fairly thin, fuselage with most of it in the nose section. The rest of the fuselage carried the two engines and, running the entire length, were the ducts through which air was fed to the turbojets, and from which the jets exhausted.

But the fully equipped fighter and its crew do not comprise the whole weapon-system. It is the most glamorous part, but without comprehensive ground support, both material and human, it cannot do its job. A complete hangar design, with all the necessary power points at the right values, special jacks and servicing platforms and specialized

tools, was necessary to enable the ground crews to keep the aircraft serviceable at all times. On the human side technicians are being trained as system-engineers who understand how and why each part of the aircraft is dependent upon the rest. For instance, fitters concerned primarily with the hydraulics will also understand, and be able to deal with, the electrics; the radar technicians will understand the other electronic items in the aircraft, and the electricians will have a bosom feeling for the problems of the engine maintenance crew.

The weapon-system concept has been successfully carried out only after a new design-philosophy had been accepted. But coupled with it were many of the old problems which beset aircraft designers, for the whole system had to achieve a very high performance over a wide range of altitudes. The result is a system which is immeasurably more effective than the old method of building the airframe, finding a suitable engine and then making room for the necessary off-the-shelf equipment.

2

One of the reasons for the persistent disappointments of architects with 'science' is that they rival St. Paul's Athenians both in their enthusiasm to 'hear some new thing' and in their failure to pay proper attention when the true word is finally delivered to them—an exception to this rule will be found in the author of the last paper this month, and, of course, there have been others who have backed up their enthusiasms with application to the facts.

But electronic computers in general, can stand as an example of

a topic on which the profession as a whole has been eager to gulp down visionary general articles of a philosophical nature, without scrutinizing either this useful tool, or their own mathematical needs to see just how far computers and architecture have anything to say to one another. In his celebrated address to the RIBA in 1959, Charles Eames proposed four mental techniques associated with computers that he felt to be of particular relevance to architecture, without specifying the how and the why of them. The paper that follows examines the how and the how far.

M. E. Drummond

COMPUTERS

There are certain techniques which have become popularized with the advent of computers, in particular

Operations research Systems simulation Linear programming Queueing theory.

Let us analyse each of these topics to see what they are and how they could be used.

First of all the term 'Operations Research' is a generic term and is synonymous with 'Management Science.' Operations Research implies an orderly approach to a problem, generally using scientific methods. The other three topics: systems simulation, linear programming and queueing theory may be thought of as being specific techniques within the field of Operations Research. The general scientific method is in five steps.

- 1. Define the problem as exactly as possible.
 - 2. Measure all quantities involved.
- 3. Distinguish between necessary factors and informative factors.
 - Set down the relationship of the factors and the problem.
 - 5. Test relationships and try to improve the system.

This is not a one-time process, but may be repeated many times. One can almost always plan to start on item 1 again after finishing item 5.

systems simulation

Consider now the topic 'Systems Simulation.' Again, this is an all embracing term. Simulation, as defined in a dictionary, 'implies assumption of a false appearance.' To simulate is 'to assume the appearance of, without the reality.' Simulation means to use some device such as a blueprint or a scale model or a mathematical model to represent some item or action.

People have been using simulation for some time without calling it that. Consider a boy with a model aeroplane. He is 'simulating' the real thing. This, of course, is the scale model principle. This principle has been used in designing bridges, buildings, dams, complete refineries, etc. The building of models, in themselves, produce static conditions. In other words, after it is finished it just sits there and looks at you. This principle can be extended to 'dynamic'

models such as a wind tunnel or a system for measuring the effect of tides and waves.

Extending further into electro-mechanical devices, we come to such things as the 'Link Trainer' and the Electric Network Analyser. The Link Trainer is used to train pilots by simulating conditions of flying. The latest flight simulators not only give simulated conditions on dials and balance of the human, but visual and audible effects as well.

The electric network analyser is an instrument specially made to simulate the effects of various loads on a power network. There is provision in the system for setting up 'power stations,' 'lengths of line,' 'transformers,' etc.

The electric network analyser is in fact a special purpose computer. It is possible to do a similar type of analysis on general purpose digital computers. To do this, one must set up a model of the problem. But, in this case, one must set up a 'mathematical model.'

A mathematical model is a description of an item or action using the language of mathematics (rather than a physical model). In a mathematical model, one sets out the quantities and their relationship to one another. There may be few equations or many equations. In the simulation of a nuclear reactor there are up to 16,000 equations. In the other extreme the expression '36-24-36' fairly well describes, mathematically, the item in question.

To a computer, the mathematical model is the equivalent of the blueprint or three-dimensional mock-up for the architect.

Consider now some of the simple problems in the field of simulation. There is the 'cut and fill' application where the computer takes rod readings from a surveyor, calculates according to certain formulae, and produces results which tell a highway engineer how to move the earth in such a way that a minimum amount is either hauled away or brought in. Items such as road gradient may be specified in this application. In this case, the computer is cutting out guess work by simulating the laying of a road bed. In this category, there are the applications of truss analysis, pipe stress analysis, calculations of moments, and calculation of hydrostatic properties of a ship.

It is possible to formulate even larger problems for solution. For example, the multicomponent distillation programme is used in the design of fractionating towers.

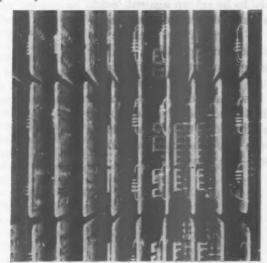


The problem here is to find the optimum location of plates in the tower to distil off required products. It is also possible to go a step further and simulate a complete refinery. This, though, is generally used as an operations application as opposed to a design application.

Other possible applications would be the effect of wind on various structures, the effect of various moving loads on structures or the effect of vibration on structures. All of these may be formulated and computed.

linear programming

The second technique to consider is 'Linear Programming.'
The precise definition of this technique is the solution of a set of simultaneous linear equations with linear restraints. A linear equation is an equation where each variable quantity is multiplied by some constant and added into a resultant



Part of the transistor-bank of IBM 7070 computer: each standard interchangeable modular unit is a printed circuit card (slightly larger than an ordinary playing card) carrying the necessary transistors and resistors to perform its assigned function.

sum. An example of a linear equation would be calculation of a bill from a wine merchant. Assume that one buys two bottles of sherry (S) at 15s., one gin (G) at 35s., six tonics (T) at 9d. and six beers (B) at 4s. 11d. (flagons, of course). To complicate matters assume one returns four empty tonics (E_T) at 3d. and five empty beers (E_B) at 6d. The cost (C) would be

C=180S+420G+9T+59B-3ET-6EB (in pence) In this case we have

C=180(2)+420(1)+9(6)+59(6)-3(4)-6(4)=1,152d.

(As an interesting exercise, try to arrange the quantities such that you spend exactly £10. You must have at least one of each quantity.)*

In the parenthetical problem there has been introduced the concept of 'restraint' or condition. In the solution of the problem these conditions must be fulfilled. These restraints must also be linear. If the problem were extended to many other items of stock with prices varying from supplier to supplier and many other restraints, such as stock availability, one would have a system of linear equation. If you tried to juggle the figures in the above equation, you might have a feeling for the amount of computation necessary in trying various values in a system of, say, 50 variables and 70 equations. In this particular problem, it would probably be solved to obtain the required number of items with a minimum cost.

Instead of this facetious example, linear programming techniques can be used to calculate optimum combination of materials at lowest cost. This could be finding a concrete mix of a given minimum strength combining various amounts and grades of cement, sand and gravel.

These principles can also be applied to the problems of finding the optimum locations of columns and beams for various loadings; or placement and size of windows for required ventilation and daylight-factor.

queueing theory

The final technique to consider is 'Queueing Theory.' This is basically a study of traffic flow, or lack of flow. It is a specialized part of systems simulation. Queueing theory is generally applied to a complex system of throughways, obstructions and intersections. ('Obstructions' includes, bridges, flyovers, etc.) From empirical data, information may be established as to the given capacity of individual throughways and intersections. A street plan is then specified so that the computer can calculate the flow and waiting times for any number of vehicles. (As a matter of interest, some programmes treat larger vehicles as one unit, other programmes as two units and still other programmes make special consideration of large vehicles.)

After specifying a street plan, the numbers of vehicles and their routes are specified along with the rate of flow trying to enter the system. All this information is combined with the data of the basic capacities of the various components of the street plan. The answer usually given is rate of flow throughout the system and waiting time at the various components.

This type of application may be used not only for highway planning and town planning, but also traffic flow within a warehouse, a factory, or an office building. It is particularly helpful in planning the floor plan of large retail stores. It could also be used in determining entry and exit points for public buildings such as auditoriums and stadiums. And this technique can also be used in planning corridors and stairways of any buildings where there is a critical traffic flow.

In the three techniques outlined, i.e. systems simulation, linear programming, and queueing theory, the principles have been known for many years. The advent of electronic computers has made possible the study of larger and more complex problems. But in every case each new application must be analysed and set out in a form suitable for computation. This can be, and usually is, an extremely difficult task.

To set out in a form suitable for computation means that quantitative data must be obtained for all relevant information. This generally eliminates 'rules of thumb.' The only sound approach is what I have called the general scientific method.

Computer manufacturers maintain large staffs of people who specialize in scientific applications. In my company these people are called applied science representatives. In other companies they may be called technical representatives or computer specialists. But these people are trained to have an expert knowledge in the equipment and techniques and an understandable knowledge in applications.

To define a problem effectively requires knowledge of the field of study, plus a knowledge of methods, plus a knowledge of equipment to be used. It is not necessary for one person







^{*} If you desire a more complicated problem, now try to total exactly £10 with the least number of bottles. Count empties as well as full; do not try to cancel.



to have all of this knowledge. In fact two persons with specialized knowledge overlapping can produce excellent results.

Just one final point on the use of computers. They deal in cold hard facts. They have no aesthetic sense whatsoever. Furthermore, they have no imagination. So, although I feel they may be used as aids to architecture, it is still for the human being to create that which is beautiful.

The mathematician having bowed himself out of architectural creativity, with a modesty that will please those who still insist that such men are 'mere technicians,' an architect now leads him back into the centre of the stage as the master of a discipline essential to architecture.

The basis of this manoeuvre is not only that mathematics is part of the traditional equipment of the architect, but that aesthetics and other aspects of human psychology are no longer mysteries necessarily to be set up against 'cold, hard facts.' Insofar as psychological matters can be assigned numerical values—and statistical techniques make it increasingly feasible to quantify them—they become susceptible to mathematical manipulation, and the paper which follows makes it clear that an increasing proportion of the most jealously-guarded 'professional secrets' of architecture are already quantifiable.

No longer can architects assume that only the basest material functions of architecture come within the purview of science. If the magic of Late Gothic is now susceptible to scientific analysis, as is suggested below, then a very large part of the psycho-physiological relationships between man and environment is likely to fall to the mathematician, not—as heretofore—the mystic.

2

Richard Liewelyn-Davies

HUMAN SCIENCES

Architecture is like the Greek giant Antaeus, who drew fresh strength from the earth whenever he was knocked down, and was therefore difficult to kill. So architecture draws strength from the basic sources of human knowledge with which it renews close acquaintance periodically. Hercules killed Antaeus by lifting him off the ground and strangling him. The nineteenth century Beaux Arts theorists very nearly did this for architecture. Under their influence we were cut off from the ground for a dangerously long period, in the fallacious belief that architecture could exist isolated from the fundamental sciences and humanities. We regained contact with reality about 1920 (Vers une Architecture was published in 1928 and the first Bauhaus opened in 1919), but we only got one foot on the ground. Roughly half the intellectual pabulum on which architecture feeds is concerned with the means of building-engineering and materials—and half with the needs—function and human requirements. With the former, the physical and engineering sciences, we are now in effective contact; with the latter, the biological and social sciences, we are still almost completely

out of touch. This article attempts to map the area we still have to explore. Developing contact with those whose work is concerned with the human being as an individual and as a member of a group may be as revolutionary for the architecture of the next thirty years as contact with the engineers and physical scientists has been in the period since 1920.

RolloD

Individual

The sciences concerned with the individual are principally biological and psychological, and include physiology, psychology and psychiatry. Applied experimental psychology includes ergonomics (human engineering) and work study.

The most direct and practical examples of the impact of these sciences is on the physical environment created within buildings. We have seen, in the last few years, the development of control over heat, sound and light blocked by lack of research into the subjective reaction of human beings to the environment. In each case the objective approach from physical sciences gives us all the tools we need to measure temperatures, noise or light, and we know how to design to give stated conditions. But the question is: what should these conditions be? What do people want? What might they want under new conditions? Active research is in progress to answer these questions, research in which human subjects are exposed to experimental environments and their reactions

gauged by various techniques. In sum, this work is developing a new sophistication in our knowledge of how buildings affect people.

At present the lighting work is perhaps the most interesting, as it already goes beyond providing a technical tool for the designer, and opens up a new vision.² It offers, to any architect who takes the trouble to master it, a new understanding of what light does. For example, Hopkinson's work helps to explain the astonishing impact of late Gothic, as in the Lady Chapel at Ely, which many architects have noticed without fully understanding. Our new understanding of light is already stimulating the appearance of new forms in architecture. The planning of new hospital buildings at Greenock and Belfast³ and the roof shape of a new laboratory at Cambridge⁴ are examples.

Light, colour and shape are interrelated and visual perception involves all of them. Research into perception psychology is active and exciting at the present time, and discoveries in this field may influence architecture profoundly. One of the better known studies is that of Ames at the Institute of Associated Research, New Haven, USA. Perhaps because Ames used full-size model rooms of distorted shape in his experiments, his work has already attracted the attention of architects, although in fact they are of less immediate impact on our work than much other research in perception. His experiments, which are discussed in a paper by Ittelson and Kirkpatrick,⁵ point to the important, if disturbing conclusion that what we 'see' is not directly related to the actual shape and colour presented to us, but is a construction of our own, based on what our mind 'bets' as to the probable meaning of our perception. For example, when observers looked into his distorted room they found it

related to the actual shape and colour presented to us, but is a construction of our own, based on what our mind 'bets' as to the probable meaning of our perception. For example, when observers looked into his distorted room they found it easier to see the room as having parallel walls, floors and ceilings, even when this involved seeing a giant standing at one side and a dwarf at the other. From our point of view the significance of this is that human beings inject an element of stored visual experience into the act of seeing, which is not therefore directly controlled by a new visual experience. However there are many other studies in this field, including some by Ames, which come nearer to the immediate problems of design. This is particularly true of studies in colour and shape perception, several of which are reported by Beardslee and Wertheimer.

An interesting angle on these questions, as yet little explored, arises from psychiatry. It seems that a major symptom in some forms of acute psychosis is a loss of comprehension of space. The patient may revert to a condition similar to that of a newborn baby-he is unable to perceive space. During treatment he may gradually recover his powers of perception, stage by stage. The importance of this phenomenon in the design of psychiatric hospitals has been recently pointed out.7 It is apparent that the architecture of the hospital may profoundly affect the patient's treatment, and perhaps even his chance of recovery, and it is almost certain that most of our existing mental hospitals present positive obstacles to effective care. Further psychiatric research in this area may have important by-products for architecture in general, and architecture may have something to contribute to psychiatry. 'It has been found repeatedly in science that the discovery that two branches are related leads to each branch helping in the development of the other.'8

social

The social sciences are concerned with the behaviour patterns of groups of people. They include anthropology, sociology, and social psychology, and in their more applied forms range through social psychology and group dynamics to operational research. These are mostly young disciplines, and they are vigorous and active. Their relation to architecture is obvious; they provide us with an understanding of what people need in buildings. They offer the hope that we may break through the rigid, nineteenth-century convention of the architects 'programme' and get back to a broader, more imaginative comprehension of our task, a comprehension which we can hope to share with our clients.

Already several multi-disciplinary teams, including architects and social scientists are at work. Study has been focused on practical problems in fields such as housing (the work in the early thirties of the Swedish Co-operative Society team is particularly interesting) or hospitals, and has been mostly at the applied end of the spectrum, employing the methods of operational research, counting and measuring human activities and applying statistical analysis. Examples include work on hospital outpatient departments which applied the mathematical theory of queues,10 and a recent study of scientists' work in laboratories by the technique of random survey.11 We are beginning to explore the more difficult, but fascinating field of what people think about the buildings we provide for them. A recent study records the judgments of a group of people on whether a room is spacious or the reverse, and attempts, by regression analysis, to establish a connection between subjective judgment and objective factors such as free floor area, ceiling height, room shape and so on.12

Conclusions of more general significance have resulted from work undertaken without a direct architectural objective. Group dynamics, in particular, is building up a picture of the functioning of human groups, which will affect room shape, room size and general planning.18 For example we now know a good deal about the optimum size of groups for various purposes, and we know that a meeting around a long narrow table will be very different to one held around a circular one.* But traffic between architecture and the social sciences is not all one way. One of the most important variables in the study of human behaviour is the building envelope within which this behaviour is observed, and architects and architectural historians are needed to define and explain this factor. The long life of buildings, when compared with the life of human organization, makes their design a conditioning factor in many of our existing habits of living and of work. This sort of feed-back is apparent in a recent French sociological study of housing, which included a series of interviews with architects, who were asked to explain their approach to the design of housing.14

mathematics and architecture

Apart from the local and immediate impact of certain sciences on aspects of design, there is a much deeper, slower, effect due to the development of new ways of thinking. Architecture has always been dependent on the general technical and philosophic climate of its epoch, a climate most easily understood in terms of mathematical ideas. Wittkower and others have shown how directly the mathematics of the Renaissance reflected the ideas of that time, and it is no exaggeration to say that the basic form of much Renaissance architecture was inspired by a mathematical attitude. In our time we have seen new branches of mathematics develop of which the most important to us







^{*} Sir Winston Churchill was using sound group dynamics when he argued that the new House of Commons should be too small to seat all the members, and should have no rostrum for speakers.

may be probability and cybernetics, and which are changing and enriching our ways of thinking in every field of human activity. Our architecture is influenced at an unconscious level by our ways of thinking: and beyond this the architecture of an epoch may express, in symbolic form, the most creative and dynamic ideas of the time. The new mathematics, developed as it partly is from the need to solve human and biological problems, problems of organized complexity, as Warren Weaver has called them, is worthy of great architecture.

bibliography

- ¹ Chrenko, F. A. Heated ceilings and comfort. Instn. Heat.
- Vent. Engrs., vol. 20. 1953. pp. 375-96.

 Parkin, P. H., and Stacy, E. F. Recent research on sound insulation in houses and flats. J. R. Inst. Brit. Archit., vol. 61. 1954. p. 9.
- Petherbridge, P., and Hopkinson, R. G. Discomfort glare and the lighting of buildings. *Trans. Illum. Engng. Soc.*, vol. 15. 1950. pp. 89-71.
- ² Nuffield Provincial Hospitals Trust. Studies in the functions and design of hospitals. 1955. pp. 91-107. Oxford University Press.
- ³ Archit. J., vol. 115. 1952. pp. 255-9. Archit. J., vol. 129. 1959. pp. 559-68.
- ⁴ Royal Institute of British Architects. Papers to be read at Laboratories 2: A symposium mainly for architects. London. 1959. pp. 21-5.
- ⁵ Ittelson and Kirkpatrick. Experiments in perception. Scientific American. 1952, 185, pp. 50-55, New York.
- ⁶ Beardslee and Wertheimer. Readings in Perception. Van Nostrand. 1958. New York.
- ⁷ Baker, A. A., Llewelyn Davies, R., and Sivadon, P. Psychiatric Services and Architecture. World Health Organization, 1959.
- 8 Ross Ashby, W. Cybernetics. p. 4. Chapman & Hall. 1957.
- Nuffield Provincial Hospitals Trust. Studies in the functions and design of hospitals. Oxford University Press. 1955.
- ¹⁰ Bailey, N. T. J. A study of queues and appointment systems in hospital outpatient departments with special reference to waiting-times. J. R. Statist. Soc. (B). 1952, 14, 185.
- Noyal Institute of British Architects. Papers to be read at Laboratories 2: A symposium mainly for architects. London. 1959. pp. 21-5.
- ¹² Nuffield Foundation, Division for Architectural Studies: The design of Research Laboratories. (In press.)
- ¹³ Cartwright, D., and Zander, A. Group Dynamics, Research and Theory. Row Peterson. New York. 1958.
- ¹⁴ Lauwe, Chombart de, et al. Famille et Habitation. Vol. 1. Science Humaines et Conceptions de l'Habitation. Centre National de la Recherche Scientifique, Paris, 1959.



BIBLIOGRAPHY



The sting of this paper is in its bibliography, a necessary minimum sampling from the more accessible parts of a body of knowledge that is unknown to architects as a profession, and directly feared by some of them as a threat to their creative architectural personality. That body of knowledge constitutes the beginning of the facts on environment, which as they accumulate may yet become an avalanche that could sweep away architecture as we know it now and leave in its place, precisely, that other architecture produced by the team-work of specialists in colour, heating, lighting, acoustics, market-research, group psychology—an architecture comparable to other aspects of creative technology-such as aircraft design or television—that are neither encumbered nor ennobled by a great tradition such as architects carry with them everywhere they go, and to every job they undertake. It seems to be no longer a question of whether architects should try to master this mass of information or not, but how much longer they can put it off—this week or the week after? Just what will happen to architecture and to architects when this happens is one of the subjects discussed in next month's 1960 paper.



a monthly review of interior design

Among the persistent interests of that group of younger British architects who are sometimes grouped together as the harbingers of a Modern Vernacular in English domestic design (cf. AR, August, 1958, p. 219) is the use of plain planked timber, usually tongued-and-grooved boards, as one of the major visual elements in interiors. Increasingly this seems to stem from a fusion of the built-in furnishings with the interior structure, so that both vertical and horizontal space-divisions, between floor and floor, room and room or even cupboard and cupboard, tend to become an independent wooden structure dropped into the main brick frame of the house. The result of this structural and visual homogeneity of the interior, coupled with the usually ingenious use of rather constricted spaces, is something of a ships-cabinaesthetic, though the resemblance to classic ship interiors stems from a similarity of problems and techniques of solution, rather than any attempt at stylistic imitation-indeed, one could wish that some British ship designers would take a leaf out of the sketchbooks of these architects.

On the following pages are illustrated a small house that takes this trend about as far as it can go at present, and a conversion scheme by one of the offices that first pioneered this type of interior, although in this case the ingenious space-handling and bold use of wood has been applied to the individual pieces of furniture rather than the general interior structure which was not equally within the designers' control.



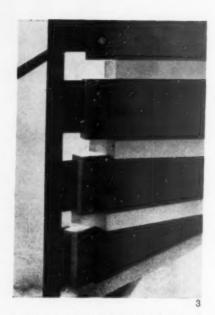
House in Kensington

architects: James Stirling and James Gowan

1, stairwell of the house in Kensington, looking upwards toward the glazed roof. The house is fitted into a very small site of difficult shape (see 6, page 193) and the two floors of living accommodation occupy most of the ground-space available, with the staircase jutting out into an adjoining area. In this view the edge of the first-floor landing marks the limit of the main site. Since the two floors are

so small the maximum use has been made of transparent screens wherever feasible, to increase the sense of space, and the open, strongly top-lit stairwell gives a feeling of spatial connection between the two floors—dramatising a functional connection, since the front room of the upper floor can be opened up to serve as an extension of the lower floor when entertaining.

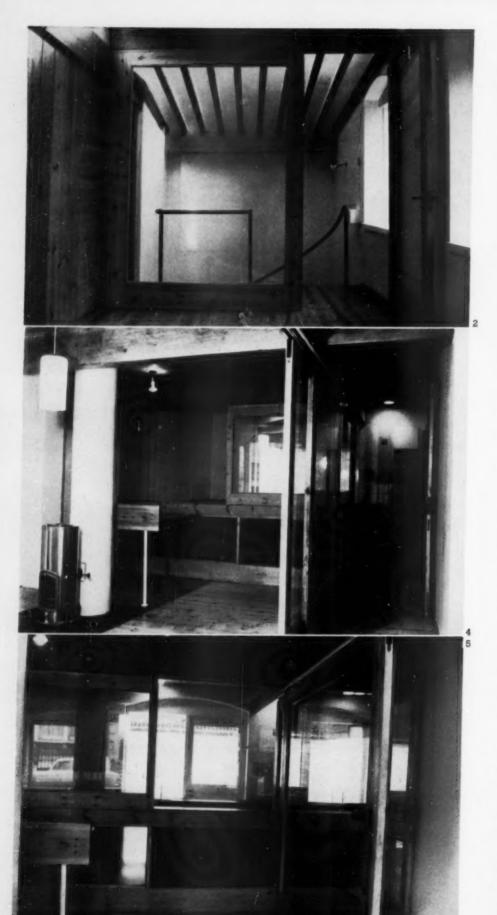
House in Kensington

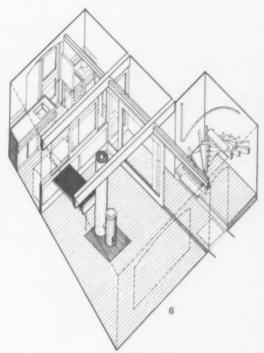


2, the upper landing and stairwell of the house in Kensington, seen from the upstairs front room. The extreme simplicity of the basic elements is summed up here by the plain rendered and painted inner faces of the exterior walls, the waxed soft-wood floor and sealed soft-wood boarded interior walls with their 'secret' doors, black painted tubular hand-rails and the two glass doors which can be folded right back to open up the landing into the room.

3, detail of staircase; timber risers are secured to brackets projecting from the central tube (see also 1, on previous page) by bolts capped over with furniture gliders, and the softwood treads add up to an exact semi-circle in plan.

4, 5, two views of the ground floor from the front of the house-in 4. looking down the corridor from the street entrance, with the stairwell on the right; in 5, from a point inside the front room itself. Corridor and room are divided by floor-to-ceiling glass screens that can be slid back to open up the whole of the downstairs front of the house. Further glass panels, above servery and work-top level, divide the front room from the kitchen, and when these are closed they help to generate a play of reflections that lighten and brighten what would otherwise have to be a rather tunnel-like interior. At the back of the free-standing stove-andchimney complex is the end support for the dining-table-even when this is flapped up out of the way, against the kitchen screens, the support serves as a barricade to ward the occupants off the hot chimney.





6, axonometric view of the ground floor and the main timber structure, including the two 12in. by 6in. pine binder-beams that support the upper floor and provide the nucleus of the whole interior construction—two similar binders carry the roof.

7, detail of the junction of the rear binder, runner beam for sliding screens and the jamb of the kitchen door. In fact, these separate wooden elements do not join but pass across one another, each preserving its identity as a structural element.

8. glass screen and corridor door at landing level; in the corridor leading to the back bedroom the 'secret' door to the bathroom has been left open, indicating the presence of a central, top-lit wooden box of cupboards, service-spaces and so forth, occupying most of the volume between the two sets of transverse binder-beams.

9, the road front of the house, showing the distribution of the windows—the stairwell lies entirely to the right of the door and the window above it. The precise shape and distribution of the windows and the 'rusticated' walling were conditions of the brief and outside the architects' control.







Conversion in Fitzjohn's Avenue, Hampstead

architects: Howell, Killick and Partridge

Described as a 'Do it yourself hotel' this conversion involved the gutting and remaking of two adjoining Victorian houses as a group of oneroom flats with extensive communal services and facilities.

I, one of the thirty-two standard bed-sitting-rooms that make up the bulk of the accommodation. All the furniture is purpose designed and built in the contractor's own workshops. This view shows the main part of the room, the rest of which forms a miniature kitchen space and an entrance corridor, separated by a wardrobe-storage unit—see plan and 5 opposite.

2, the exterior shows how the conversion has been fitted in to the existing structure. The entrances from the outer porches have been stopped off (the porches becoming balconies for the two-room flats at ground-floor





level) and a new entrance hall and other rooms created in what was originally a gap between the two houses. In the main bay of each house, a double-window indicates the presence of two rooms fitted between the structural walls of the old house, while the tile hanging serves to regularise the consequences of dropping the ceilings (which was visually necessary) without varying the positions of the floors.



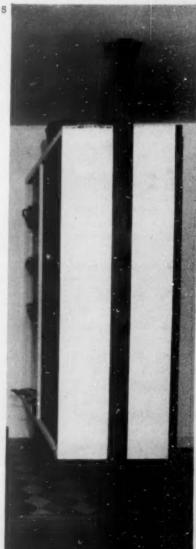
3, the construction on the end of the bed (see 1, opposite) opens up to form a small dressing table, with a mirror in the lid, and a deep drawer beneath. Although well away from its traditional English location blocking the light from the window, the table is not illlit, as will be seen from the switched cable and reflection on the wall, and is, in any case, handily placed for the wardrobe fitment, whose extreme edge may be seen in 1 also.

4, small chair, with seatcushion removed. The structural principle employed here, with the wooden members passing over one another without interpenetrating is the standard constructional method for all the purpose built furniture the architects have designed for this scheme, 5 and is, of course, directly comparable in method, if not effect, with the structural woodwork of the house in Kensington illustrated on the immediately preceding pages.

5, the wardrobe/storage unit and a corner of the kitchen dais. The elevation of this part of the room's floor by some three inches and the use of patterned lino instead of plain carpet makes a sufficient distinction between the kitchen area and the rest of the room, while the carrying of the wardrobe unit on a floor-to-ceiling bracer is part of a general policy of carrying all built-in units clear of any existing cornices and skirtings. The tableware on the shelves was, like everything else not designed by the architects, of their selection.

6, ground floor plan; on other floors there can be no corner porch-flat (6) while on the third floor the turret room (5) has a small staircase to the room in the roof above, and thus becomes part of a two room, duplex apartment.





key to plan

2. housekeeper's room

3, garden room,

oom. 6, porch flat.

7, baths, w.c.-s, etc.
8, standard kitchen units







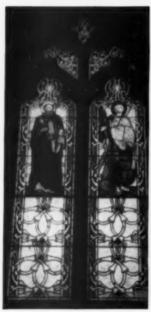


Mr. Sewter, who is head of the History of Art Department in the University of Manchester, has been engaged for about four and a half years on a detailed investigation of the stained glass of William Morris and his associates. His survey of the material is still incomplete, but he has already seen a total of something like a thousand windows, in some four hundred buildings scattered all over Great Britain. He here draws some conclusions from this material.













WILLIAM MORRIS'S DESIGNS FOR STAINED GLASS

It is a surprising fact that, in spite of a pretty widespread ac-knowledgment that the stained glass made by the firm of Morris & Co. in the last four decades of the nineteenth century attained a higher level of quality than had been seen for three or four hundred years, no thorough and systematic examination of the material has ever been made. Thus a fundamental misconception about Morris's own share in stained glass production has remained in currency, even among scholars who have made detailed studies of other aspects of his astonishingly varied activities.

This misconception is primarily due to a passage in Mackail's Life,

which runs as follows:
'He (i.e. Morris) seldom at any time, and never in more recent years, made complete designs for windows himself. From the first, the figure-subjects were mainly supplied by those of his colleagues who were professional painters. As time went on, they came almost exclusively from the studio of Burne-Jones, who supplied no cartoons for glass except to the firm (of Morris & But backgrounds and foliage were, as a rule, of Mor-ris's designing, the animals and certain kinds of ornament being often drawn by Webb."1

As a highly condensed summary of the practices of some thirty-five years of production from Morris's stained glass workshops, this was fair enough. It is that single word 'seldom' to which too much force has been allowed. Mackail's statement would hardly lead one to expect what other evidence conclusively demonstrates; and it is not surprising that a general impression prevails that Morris's work as a figure designer was confined almost exclusively to his contributions to the Oxford Union 'frescoes,' the angels on the ceiling of Jesus College Chapel, one or two cartoons for embroidery, a few painted panels on furniture, and one oil-painting.

In various museums, however, there are a number of figure cartoons for stained glass, attributed

tion deriving from excellent sources. To quote but a single instance, the cartoon Ascension of c. 1861 at All Saints' church, Selsley, Glos., in the City of Birmingham Art Gallery (584'04), was presented by C. Fairfax Murray in 1904; and there are others in the Tate Gallery, in William Morris Gallery at Walthamstow, and elsewhere. These attributions are entirely borne out by the style of the designs themselves, which is recog-nizably different from the work of D. G. Rossetti, Burne-Jones, Ford Madox Brown and the other artists who designed glass for the firm during Morris's lifetime.²

to Morris on the basis of informa-

Even this evidence, however, hardly prepares one for the surprise that must result from a study of some MS volumes of notes and indexes, and annotated volumes of photographs compiled by the late H. C. Marillier, last managing director of the firm of Morris & Co., which now belong to the City of Birmingham Art Gallery.º One of these (604'40-D), an alphabetical index of stained glass cartoons by subjects, gives the clearest indication of the position. It attributes to Morris himself no fewer than 129 cartoons, not counting a few which, on the evidence of Philip Webb's accountbook with the firm for the years 1861 to 1876, were in fact by him. A large proportion of this very considerable number consists, it is true, of small minstrel angels for tracery lights, but there is also a considerable number of designs for large figures, including for example a St. Catherine, a St. Cecilia, a Jacob, St. James the Greater, a Joseph, St. Luke, Martha, several St. Mary Magdalens, two Ruths, St. Thomas, Zacharias, etc., as well as a number of compositions of several figures, such as The Annunciation, The Marriage at Cana, the

The others were Philip Webb, Sholomon, Arthur Hughes and Val Pritith the possible addition of G. J. Faul.
P. Marshall and George Campfield,

10, Minstrel figure with mandolin: a stained-glass panel after a cartoon by William

Morris, with a background of square quarries with stylized flowers -c. 1872-4.

Last Supper, St. Paul Preaching. the Presentation in the Templ and several scenes from set of designs illustrating the story of Tristram and Yseult story of Tristram and done for Harden Hall, Bingley, and now in the Cartwight Memorial Hall, Bradford. On the basis of these secure attributions, some dozens more may quite confidently be ascribed to him also, bringing the total up to something in the region of 150 designs. This certainly throws a totally new light on Morris's activity as a figure artist. There is, moreover, still every reason attribute to him most of the designs for background quarries used in the windows, s as well as the foliage and other patterns often used in backgrounds.

On the other hand, credit for the general arrangement of a great

many window schemes must be taken away from Morris and given to Webb. It has generally been concluded from the passages in Mackail's Life immediately preceding and following that quoted above, that the layout as well as the colouring of a window were due to Morris. Webb's account-book entries, however, are specific on this point in a number of instances: for example the very first entry in the book (undated but presumably 1861): 'Glass (stained) for King's Stanley Church, Designs for.' Scale-drawing of arrangement of nave windows with scheme for whole church . . £3.' Similarly in the cases of St. Martin's, Scarborough, Christ Church, Southgate, Dedworth Parish Church, etc. It was plainly Webb who worked out the general scheme.

It is also possible to define precisely the 'certain kinds of

It is also possible to define precisely the 'certain kinds of ornament' which Mackail mentions

1 J. W. Mackail, The Life of William ferrie Pocket Edition 1012 Vol. E. p. 44.

⁶ In fact for the church of All finists claicy, newly built by Bodley to serve as rea formerly in the parish of Xing's Stanley

as 'being often drawn by Webb.' These were in fact of three kinds: firstly, the architectural canopies and pedestals, in a late Gothic manner, in which many of the figures of saints were placed in the firm's early windows, as for instance at Amington, Langton Green, Southgate, Camberwell, Haywards Heath, Cheddleton, etc.; secondly there was heraldic work and designs to be treated in a heraldic manner, as with Emblems of the Passion, banners of the Tribes of Israel, etc.; and thirdly, in Webb's own term 'pattern-work,' which was generally of an extremely bold and geometrical character. Excellent examples of this last can be seen at St. Edmund Hall Chapel, Oxford, at Cranborne, Berks, and in the little gallery windows at Kentish Town Parish Church, with four subjects in

church, with four subjects in roundels by Burne-Jones.

All of this information helps to make clear what parts of the designs were Morris's own; they must include, besides the background features already mentioned, scrolls and inscriptions, borders, and, most important of all, the colouring and the interpretation of the design, which Mackail emphatically states came under his personal direction. This amounts, it must be said, to a well-nigh incredible addition to the activities of a man whose life, quite apart from this field of work, was filled with a greater output than most busy artists could accomplish in twenty times as long. But with Morris normal measures of what is credible simply do not apply.

Morris's Backgrounds

Possibly the most interesting aspect of all these contributions as designer to the stained glass studio of his firm is Morris's backgrounds, since these can be readily related to his work in other media (tapestry, printed fabrics, wall-papers, etc.), and because these backgrounds influenced in a fundamental way the whole style and appearance of the windows at different periods. The earliest Morris windows, in the years 1861-8, do not yet show any awareness of the possibilities of using backgrounds as a means of relating together the several lights of which most windows were composed; nor was there any sign of this conception of the function of backgrounds in Burne-Jones's designs, made by Powell's, for windows at Bradfield College and Waltham Abbey. The figure-subjects, as at Seisley for instance, were simply provided with aframing of borders running independently of the outlines of the lights, and contrasted with areas of pale, almost transparent quarries, or with Webb's bold geometrical

pattern-work. In those instar pattern-work. In those instances where the subject consisted of a single figure, as in the four Archangels at the west end of St. Michael's, Brighton, the figures were designed in such a way as to fill the whole space, or else, as in the Adam and Eve at the west end of St. Martin's, Scarborough, they are access as the second of St. Martin's, Scarborough, end of St. Martin's, Scarborough, they are again set as panels with a surround of quarries. Another type of solution to this problem was used in the case of the set of four Evangelists designed by Mor-ris and Madox Brown in 1862 for Southgate, 1, where the greater part of the space between figure and border is occupied by a Gothic canopy designed by Webb. Amongst the earliest examples where the background begins to form an important ingredient in the total effect is the east window at Amington, made in 1864, where each of the three main subjects (Christ on the Cross, with the Virgin and St. John) is set against a pattern of sonn) is set against a pattern of tall straight pale-green palm leaves, which must have been designed by Morris. The device was used again at St. Michael Penkevil, two years later, and at Catton in Yorkshire, with slightly greater complexity; but it did not lead at once to the more elaborate foliage backgrounds that Morris was to use habitually later on. In many windows typical of the later 1860's and early 1870's the figures are set simply among quarries, as in the east window at Marple (1869-70), 2, or maybe with a rosehedge background to the lower parts of the figures, and quarries above, as in the 1873 window

over the sedilia in the same church. But within this phase there occur several examples of attempts to develop a richer texture in the quarries themselves, by setting them in herring-bone patterns, as at Edgehill, Liverpool (1873), or interspersed with diagonal bands of inscription, as at Beaudesert, Henley-in-Arden. And there are also one or two instances of the use of a sort of wave- or shell-pattern, in combination with serolls (as in the Chancel south window at St. John's, Tuebrook, Liverpool, c. 1868), or with flaming stars (as at Tilehurst near Reading, 1869), 3.

That these last examples belong to a phase of conscious experimen-tation with background treatments is confirmed when we find the Melchisedek at Scarborough (1873) set against a kind of mosaic pattern spattered with dots; and in the Daniel window of the same year, next to him, we find an early example of the dark grounds covered with rather abstract scrollwork, 4, which continue to recur during the ensuing decades. Al-ready by 1872 the very striking Absolom window at Knotty Ash, 5, had employed bold, large-scale and rather naturalistic tree-foliage (for which, however, Burne-Jon may have been responsible), while other bold experiments with scrolled and intertwined vines hold together the three-light east window at Brown Edge, Staffs, 6, of 1874, and the two-light window of the same date at St. Philip's, Alderley Edge, Cheshire, 7. The influence of Celtic art may certainly be detected in these.

From Scrollwork to Foliage

The variety of these background devices is, indeed, astonishing. As early as 1866, in the east window at Middleton Cheney, Morris had used a foliage background of oak, rose, pomegranate and apple, with fruits, in the narrow spaces between and around his figures, but kept the tone to a pale blue-green. In the extremely beautiful Archangels window at King's Walden, 8, of c. 1869, the background is still the rather abstract scrollwork patterning; and in the 1873 west windows at Speldhurst small trees in a rather stylized Gothic manner are set in a field of simple flat pattern. But by this time the naturalistic tendency had become dominant. Sometimes pale in colour and open in texture (as at Bramley near Leeds, 1875), sometimes rather dark in tone and densely packed, with no clear spaces between (as at Tadcaster, 1879), these naturalistic foliage grounds become typical of the later phases of Morris's windows; and the general tendency seems to have been for the paler, more open type with prominent stems running in long continuous curves, to give way, especially after about 1883, to the dense type, though there are exceptions.

Almost every one of these backgrounds—and there are hundreds of them—must have been individually and separately designed; if Morris undertook all this work personally, which is what the authorities lead us to believe, he must have been occupied for a major portion of his time on them. It is, in fact, impossible to conceive





11 (left), The Ascension; 12 (right), St. Paul Preaching: cartoons by Morris for Scholey, Glos.—1861. In these early designs there is an obvious power of imagination, but an awkwardness due to his inexperience in drawing the human figure. There is a lack of form beneath the draperies.

whole, the least interesting part of the stained glass. There is little, if any, ovideno in them to suggest Morris's own hand, and they may quite possibly have been left to Campribeld or other members of the studio to dealess, under Morris's direction.

that Morris designed every one; no doubt the master-type, so to speak, was due to him personally, but the variations and adaptations of it must have been drawn by some assistant in the studio. In the same way, when we come across an exceptional background, like the draperies unevenly hung from rods over the heads of the figures in the St. Nicholas window of 1882 at Welton, Yorkshire, it is needless to assume that it was actually designed, rather than perhaps suggested, by Morris himself.

In a number of the firm's later windows, these foliage backof Burne-Jones's figures their original backgrounds were replaced by landscapes.

In the words of Lewis F. Day, who knew Morris well, and who knew as much about ornament as anyone in his generation, Morris 'preferred pattern which did not hide its structure; much ingenuity, he thought, was wasted in masking the constructional lines of design, they gave largeness and nobility to it; and "the obvious presence of geometric order" prevented the effect of restlessness. This comment seems very relevant when we look at the splendid west window at Gateacre (1883), 9; but



14, Angel of the Resurrection, a cartoon for 'The Three Maries at the Empty Sepulchre,' a window in St. Michael's, Brighton, 1802. The figure, and especially the draperies, have more grace than in the Selely cartoons (facing page) but the angel does not rest very convincingly on the tomb and Morris evidently had difficulty in placing the lead-lines in the lower part.

Improved Drawing

At any rate there can be no doubt that Morris's personal participation in the work of the stained glass studio declined very much after the first decade of production. So far as his designs of figures and figure-compositions are concerned, these apparently ceased altogether by about 1873, perhaps several years earlier; and the vast majority of them belong to the first phase of production from 1861 to 1868, though repetitions of some continued to be produced long afterwards.

The early cartoons reveal clearly enough both the quality of his pictorial imagination and his lack of experience and facility in drawing the human figure. The Selsley Ascension cartoon at Birmingham (534'04), 11, or the St. Preaching, for the same church, 12 (Walthamstow A24), both of which were done in 1861, are characteristic. The scenes vivid and expressive, but the draperies are awkward and the forms of the figures beneath them are in places hardly considered. Morris rapidly improved in his ability to design draperies, and by the date of the Minstrel Figures, 10, of which there are small series at the Victoria and Albert Museum (designed c. 1867, made c. 1872-4), his figures had acquired a more relaxed and easy posture; but always in his figure designs Morris tended to use draperies as a means of avoiding the drawing of the figure. It is significant that whereas Burne-Jones nearly always made nude studies for his figures before draping them, no nude studies by Morris are known.

The most elaborate and ambitious of Morris's figure compositions is the Presentation in the Temple, 13, in two separate panels, designed for Bishop's Tachbrook about 1863, and repeated on a

smaller scale later elsewhere. The cartoons are at Welthamstow (A13-14). One cannot help noticing that although there are altogether



15, The Virgin Mary, a various version of a figure in 'The Three Maries' at Brighton (see above). It shows the advance in Morris's power of designing draperies.



13, The Presentation in the Temple, left panel: a cartoon by Morris for Bishop's Tachbrook, c. 1863. This is one of his most ambitious figure compositions.

grounds disappear, as an increasing use of architectural and landscape backgrounds develops in Burne-Jones's cartoons; and this tendency continues after the deaths of Morris and Burne-Jones, when Henry Dearle became chief designer to the stained glass workshop. In repetitions of many

unless Morris's own views changed, the supplanting of this style by the dense, rich type of foliage with fruit and flowers should perhaps be attributed to other influences than his.

6 The Art of William Morrie, Easter Art Annual, 1899, p. 19. nine figures, only eight hands between the lot of them are actually revealed. Another two-panel design, The Three Maries of the Empty Sepulche for St. Michael's, Brighton, 1862, of which the eartoon for the left panel, 14, is in the Tate Gallery (5228), still shows some awkwardness in the placing of the lead-lines and in the uncertain relationship of the Angel's figure to the tomb on which he supposedly sits, but the draperies are certainly more graceful; and the variant cartoon of the Virgin from the right-hand panel, 15, which is at Walthamstow (A42), marks a very great improvement in his control of drapery forms and rhythms. drapery forms and rhythms.

None of Morris's figures ever proved so popular with the firm's clients as certain of Hurne-Jones's, which were used over thirty times. Apart from small angels and min-strel figures, the most popular of Morris's single figures was a St. Peter, done in the first place for All Saints, Cambridge, and repeated at least ten times elsewhere. This may be significant, for all his figures have certain qualities of strength, weight, and quantes of strength, weight, and stiff dignity, appropriate in this particular subject, which dis-tinguished them from Madox Brown's more dramatic and Burne-Jones's more elegant designs. Had he continued to design signs. Had he continued to design figures, however, very likely Morris would have steadily acquired a more easy and graceful style. In any case, in a window like that representing St. Mary Magdalen, Martha and a Minstrel Angel in the tracery, at Edgmond, Shropshire, 1876, his designs are capable of a not unfavourable comparison with Burne-Jones's figures of about the same date. of about the same date.

Nevertheless, it would be impossible for the most ardent of Morris's admirers to claim that Morrie's admirers to claim that he brought to the designing of figures any gifts which his colleague and friend did not possess more abundantly, and it was presumably the realization of this fact, as much as the pressure of other interests, which induced him to give up designing figures for stained glass. His close familiarity with the processes of the workshop, however, as well as his genius for exploiting the technical possibilities of whatever medium he worked in, opened up for him he worked in, opened up for him new potentialities in pattern-work which could be applied to the enrichment of figures, whether his own or those of others.

Teliew State

The technical aspects of Morris glass require closer study than I have been able to give them as yet, but it is clear that he gave particular attention to the use of yellow stain. He used it to tremendous effect, not only as a major element in colour-schemes, for draperies, hair and other details of figures, but especially for rendering on glass an equivafor rendering on glass an equiva-lent of embroidered and damask

designs on costume. Many of Morris's own later figure-cartoons show draperies very broadly and simply designed, so as to provide ample fields for the use of yellow-stain ornament, which told most

of the firm's output, like the Cheddleton Angels window of 1869, and the Bagian St. Cecilia window of 1880, could be pro-duced. The window which perhaps shows most perfectly this minor-



16, St. Cyprian, a cartoon by Morris for Bradford Cathedral, 1864. The embroidered patterns were designed to be carried out in his famous yellow stain.

effectively, of course, against a white ground, but was also used in combination with a variety of other colours. The St. Cyprian cartoon of 1864 for Bradford Parish Church (now Cathedral), 16, Parish Church (now Cathedral), 16, which is at Walthamstow (A15), is a good example. The Morris workshop, indeed, attained in time an unrivalled mastery in the use of this stain, and was able to produce a range of tints and tones of gold from the palest yellow to the most intense reddish bronze. It was only when experience It was only when experience with this technique had been acquired that some of the glories

pattern aspect of Morris's glass is pattern aspect of Morns's glass is one which has been referred to already, namely the Archangels window at King's Walden, c. 1869, 8, where, incidentally, all the figures are from his designs also. The figures are covered from head to toe with intricate decorative ornament, and the backgrounds also; but so broad and simple are the main lines of the designs that there can be no question of over-ornamentation. This window is among the greatest successes in all modern stained glass; and the credit for it belongs almost entirely to Morris himself.

current architecture recent buildings of interest briefly illustrated

MAISONETTES, CAMBERWELL, LONDON

ARCHITECT: F. O. HAYES (Borough Architect) Architect in charge: H. P. Trenton

Two fifteen-storey blocks, forming part of a large housing scheme known as Sceaux Gardens, which consists otherwise of six-storey maisonettes, six-storey flats and single-storey houses, together with shops, garages, etc. The various blocks are planned to enclose a number of spaces furnished with well grown trees. The fifteen-storey

blocks illustrated here are parallel with one another, near the eastern and western boundaries of the site.

The maisonettes are of the interlocking type, reached by corridors on alternate floors. On the floors between, kitchens and living-rooms alternate along the building on both sides. They are separated only by a glazed screen.



1, west side of one of the two fifteenstorey blocks of maisonettes on the Camberwell Borough Council's Sceaux Gardens site. The detached chimney, partly hidden by a tree, belongs to the boiler-house, occupying half the basement of the block, which serves the whole site.



2 (left), view from one of the fifteen-storey blocks looking towards the other, with one-storey houses (still under construction) between. On the left, six-storey flats forming part of the same development. 3, a pair of shops facing the pared space in front of one of the fifteen-storey blocks, with the other seen in the background.

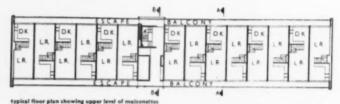
Maisonettes, Camberwell, London

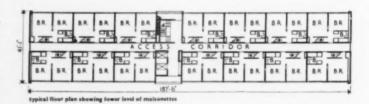
Access is at the lower (bedroom-floor) level, from which internal stairs lead directly to the living-rooms. A central staircase and lifts serve the whole block.

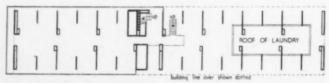
The ground floors contain a laundry and, in one of the blocks, a boiler-house. The other block has stores on the ground floor and a mezzanine floor above left open as a play-deck.

Construction is reinforced concrete, with the flank walls faced with grey mosaic. On the ground floor the concrete is left untreated. Panels beneath the windows are glazed, with an aluminium-faced plaster-board backing. The boiler-house is enclosed by obscured glass.

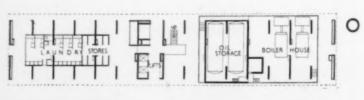








mezzanine of eastern block, with play-deck on lef



around floor plan of western block

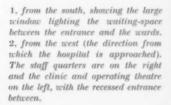
HOSPITAL, ALDERNEY, CHANNEL ISLANDS

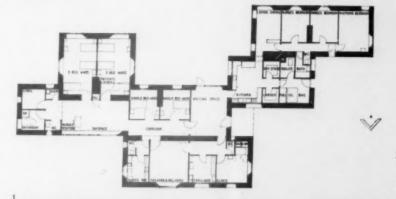
ARCHITECT: R. LLEWELYN DAVIES

An eight-bed hospital, paid for out of funds made available to the Mignot Memorial Trust by the Nuffield Provincial Hospitals Trust. The site is extremely exposed and slopes upwards to the south. To the north there is an extensive view.

The eight beds are in two three-bed wards and two single-bed wards. There is a day space and the usual ward facilities. These are shared with a small cut-patient department and there is also a combined operating theatre and delivery room. There is also staff accommodation for the matron and two nurses.

The hospital is built of local stone salvaged from a nearby derelict chapel. The external walls are of cavity construction, with an inner leaf of 3-in. locally produced concrete blocks. The roof is of slate and the larger rooms extend up into the roof space. The hospital is centrally heated from an oil-fired boiler.















3, entrance to the ward area, showing ceiling following the slope of the roof. 4, waiting space at entrance to wards. 5, the operating theatre (also used as a delivery room). 6, the hospital from the south-east; staff wing on left. Walls are load-bearing. The outer leaf of the cavity wall is local stone; the inner leaf concrete blocks. Roofs are slate.

Hospital, Alderney, Channel Islands



FLATS AND MAISONETTES, GLOUCESTER

ARCHITECT: J. V. WALL (City Architect) Architect in charge: J. V. Ault



1 (right), from within Fountain Square, with the cathedral tower visible above the two-storey block.

Lighting-up time

Be it office or factory, shop or farm or ...! In short, wherever the need is for natural light, there should be UNILUX Translucent Sheeting. Lightweight UNILUX, in a variety of shades, can be supplied to conform with any standard profile and permits 85% light transmission with maximum diffusion. It is fire-retardant, shatter-and-shock proof, weather-proof, unaffected by climatic conditions, easy-to-work and easy-to-fix.

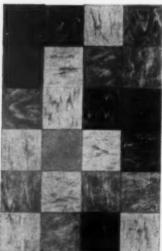
UNILUX is made by a member-company of the U.A.M. Groupa name synonymous with "better building" - whose bi-monthly bulletin "U.A.M. GROUP INFORMATION" is published to keep you informed of the Group's activities. May we add your name to our Mailing List?

Unilux the Best in Translucent Sheeting.

U.A.M. PLASTICS LIMITED . TOLPITS . WATFORD . HERTFORDSHIRE

a member of the UAM group of companies





"Vinylex tiles at the Shires Restaurant St. Pancras Station".

Semtex, manufacturers of a wide range of flooring materials, including Semastic Decorative
Tiles, Semflex Tiles, Vinylex Tiles,
Dunlop Rubber Flooring and Vertilex
Decorative Wall Tiles, will employ their vast resources in taking welcome responsibility for your entire flooring operation.
Twenty contracting branches throughout the country will advise readily on all flooring and pre-treatment problems and offer a highly-skilled laying service, providing, in addition, comprehensive facilities for design.

IMAGINATIVE MODERN FLOORS

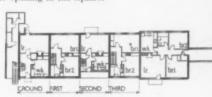
Semtex Ltd

SEMTEX LTD - SEMTEX HOUSE - 19/20 BERNERS STREET - LONDON W.1 - TEL: LANGHAM 0401

C= /60 se/c

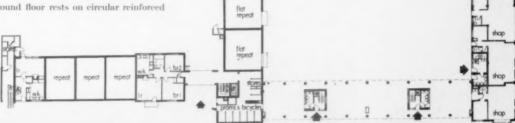
Flats and Maisonettes, Gloucester

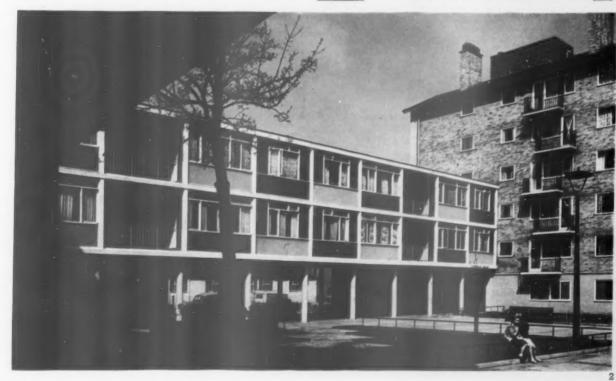
The first instalment (known as Fountain Square) of the development for housing of a 13-acre site close to the cathedral. Four rectangular blocks, varying in height from two to six storeys, surround a paved square, open only at the southern corner but also entered beneath the block occupying the north-west side, which has an open ground floor. A fifth block is linked to the northern corner. The layout takes careful note of views of the cathedral, and of the tower of St. Nicholas church, which is seen through the opening in the square.



Twenty-one two-bedroom and forty-three one-bedroom dwellings are provided, as well as three lock-up shops. The problem of lighting at the corners has been solved by the use of internal bathrooms and lavatories. The six-storey block of flats has a concrete box frame and the four-storey maisonette block has brick cross-wall construction. The lower link blocks expose a white structural frame with panels below the windows of alternating dark green and light green cement glaze on rendering. Infill between windows is hardwood horizontal boarding. The block with open ground floor rests on circular reinforced concrete columns.

2, the threestorey block raisea on columns, linking the two high blocks.





EXHIBITIONS

PAINTINGS and SCULPTURE

Prize-giving lends the John Moores Liverpool Exhibitions something of the solemnity of a cattle show. This is all to the good, and if members of the public could be admitted while the judges go about their highly specialized work they would soon realize that these art adjudicators are as knowledgeable in their way as the men in long white coats who tap the chests of bulls and stare thoughtfully at the underneaths of cows. Paintings and bulls which have been awarded prizes naturally tend to look fatter and sleeker than the others, but the public is not as obtuse as it's made out to be; it knows that there's more to a bull than its appearance, and only needs to see a few experts going over a painting-counting its colour values, testing for communication quality, measuring the depth of flat space and so on-to become a little less certain that the exhibits it likes best ought to be given the

At the first of the John Moores exhibitions, held in 1957, the realist painters who at that time were regular exhibitors at the Beaux Arts Gallery were represented in force; they dominated the show, and Smith and Bratby deservedly carried off the premier awards. Something similar has happened at the second exhibition. But between the two shows, the Beaux Arts team disintegrated, and the painters represented in force at the second exhibition were the Cornish abstractionists who regularly exhibit at the Waddington Galleries. The premier award of £1,000 went to Patrick Heron; a smaller prize went to Roger Hilton, and Terry Frost's exhibit was bought by the Walker Art Gallery, where the exhibitions are held. The £500 prize for painting was awarded to William Scott, who exhibits at the Hanover Gallery, and the £400 prize to Peter Lanyon, who is one of Gimpel's men, but both of them are allies of the Waddington group. Lanyon is a Cornish abstractionist and Scott likes to think of himself as belonging to the 'West Country School.' 'I call it "West Country School",' he recently explained to a correspondent of The Times, 'to include me, as a painter in Somerset, with those of St. Ives who since Ben Nicholson worked there have become a group to be reckoned with.' So I think we can take it for granted that the outstanding successes of the Cornish abstrac-



tionists at Liverpool are due in no small measure to efficient organization. I took it as another sign of effective group intervention that a totally incoherent painting by the Cornish abstractionist Trevor Bell was one of the 113 open entries chosen for exhibition out of a total of 1,620 works submitted. It only remains to be said that the prize-winners I've mentioned painted some of the best pictures in the show. They're all drunk with the idea of painting about paint, and they paint very well. Scott's 'Blue Abstract,' 1, would probably be outstanding in any exhibition of contemporary art. The Heron, 2,



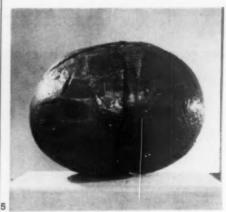
although unbalanced in composition, is among his most notable works. The Lanyon, 3, is a typical example of his unremitting efforts to paint as if he were a rough sea, but Roger Hilton, pursuing too



adeptly the role of roughneck aesthete, has finally produced in 'Yellow, April, 1959,' 4, a painting that can be called *chic*. The first prize for sculpture was awarded



to a lopsided egg with excreseences executed in unpolished aluminium by Hubert Dalwood, 5, and although I think that the lopsided egg with excrescences made by Paolozzi a few years ago is more lively and original, the Dalwood was undoubtedly the most pleasantly calli-



pygian piece on view.

John Moores intends to make the competition a biennial event, and it will be particularly interesting to see what happens next time. The Wadd ngton group will probably become stronger still during the next two years, Beaux Arts policy may well be re-integrated around school of Bomberg, and there are indications that another London gallery is signing up a very strong team of painters and sculptors without invading either Waddington or Beaux Arts territory, and if it should become interested in the Liverpool enter-



WPM MORTIMER STREET

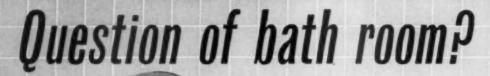
You are invited to visit our spacious showroom on the 1st Floor and to make use of the improved facilities of our special advisory service. Our artist John Drummond depicts Palladio Magnus wallpaper "Forma" No. 44450 as used in a shop reception area.



FOR ARCHITECTS CONCERNED WITH THE SPECIFICATION OR DIRECTION OF DECORATIVE SCHEMES THE FOLLOWING COLLECTIONS ARE AVAILABLE

PALLADIO HAYWARD THE ARCHITECTS BOOK

THE ARCHITECTS' DEPARTMENT THE WALL PAPER MANUFACTURERS LIMITED 19 21 MORTIMER STREET LONDON WI OR KING'S HOUSE KING STREET WEST MANCHESTER 3





Voque answers it beautifully

The Allied Vogue is more than just a good-looking bath. It's well-made, well-finished and comparatively inexpensive. Vogue's good looks stem from the care and skill of Allied designers—whose concern with comfort and safety shows in Vogue's flat interior base; Vogue's strength, permanence and durability are due to its cast-iron construction; the gleaming vitreous enamelled finish is exclusive to Allied; and the Vogue can be fitted into every bathroom quite economically... with the certainty



that its final users will applaud your choice.

Obtainable in the colour-scheme shade you want, the Vogue is both beautiful and budgetable. Please write for literature.

Allied Ironfounders Ltd.

Bath Division, Greenford, Middx.



for beauty

prise the results could be very lively indeed, with sculpture playing as important a part as the painting.

An elegant new gallery, McRoberts and Tunnard in Curzon Street, has opened with an exhibition of paintings by John Tunnard, who is a cousin of one of the proprietors. Although this is Tunnard's first exhibition in London since 1942, his early work made a big enough impression to be included in important anthologies of contemporary British painting for several years after he stopped exhibiting. He, too, is a Cornish abstractionist, but not of the kind that figured so prominently at Liverpool. He owed something to Nicholson and something to Paul Nash, but invented a mechanistic imagery with surrealist overtones. In his latest work he has not attempted to bring his aesthetic up to date, but some of his pictures look 'modern' in the sense that they would be suitable for some of the high class advertising put out by the big electronics companies.

His painting of an abandoned Cornish tin mine, framed by an imaginary abstract fossil and backed by 'treacherous' space, 6, would be typical of his work if the apparatus were more a matter of trans-

parent screens and sensitive-looking wires.

The exhibition of Italian Paintings from British Collections at Burlington House is perhaps as much a triumph for English art historians as for Italian art. Galleries X and XI celebrate not only the Seicento but the enthusiasm, scholarship and brilliant finds of Denis Mahon, and the Central Hall is placed at the disposal of David Carritt's dazzling discovery of five large decorative paintings by Guardi.

The exhibition would appear to be dedicated to the notion that the twentieth century has taken a great leap forward in sensibility, and that the enlargement of the historical sense has banished period taste for ever. All periods and styles are now supposed to be of equal interest. It's a nice thought, and anyone who can honestly say that he finds the large, awful, necelassical 'Nolime Tangere' by Mengs,



in Gallery VI, as interesting as, say, Tiepolo's rococo 'The Meeting of Anthony and Cleopatra,' in the Architectural Room, might conceivably claim to have greater 'awareness' than either Mengs or Tiepolo since they must have hated one anothers work: on the other hand it could be argued that such awareness is too passive to be of much consequence and that loving and hating might be more indicative of awareness than an evenly spread liking. In any case, I have a sneaking suspicion that we are expected to be extra sensitive when we reach Galleries X and XI, where the seventeenth-century paintings acquired by British collectors in recent years fill the air with histrionics. Serious and valuable researches as well as inflated value judgements are concomitants of this latest fashion in collecting, and it is to be hoped

that some of the pictures—I have particularly in mind Guercino's 'The Mystic Marriage of St. Catherine,' which is a superbly efficient essay in sentimentality—will not be too drastically demoted when the revivalist fervour dies down.

Saraceni's 'The Spinario,' 7, lent by Benedict Nicolson, is in Gallery II instead of X or XI because it was brought to England in the seventeenth century. I reproduce this 'youth taking a thorn from his foot, done after the Antique' for mixed motives. In the first place, as a slight bow to the Seicento, secondly, because I am easily seduced by simple stereoscopic effects, but most of all because the youth has something of the same build as Caravaggio's magnificently impudent 'Nude Youth with a Ram'-one of the highlights of the Wildenstein exhibition 'Artists in 17th-Century Rome' which could be described as the first public announcement of England's re-discovery of the Seicento.

The Guardi decorations are based on some Piazzetta engravings of romantic episodes from Tasso's Jerusalem Delivered. In 'Carlo and Ubaldo resisting the enchantments of Armida's nymphs,' 8, the resistance is understandably slight, and not altogether out of touch with Tasso's poem, for Armida, the wizard king's niece, is, like her nymphs, charm itself, and when Rinaldo, prince of Este, goes to rescue all the Christian knights she holds prisoner. he settles down with her very happily in her enchanted garden until someone reminds him that he is supposed to be on a crusade. Each of the paintings is concerned in one way or another with the intervention of a beautiful maiden, and the paint acknowledges her presence with a rich, sensual tenderness.

The collecting of those thirteenth, fourteenth and fifteenth century Italian paintings known as 'primitives' did not begin seriously until the nineteenth century, but the wonderful group of works by such



masters as Martini, Lorenzetti and Giovanni di Paolo in Gallery IX testify to the enthusiasm and discernment of a very mixed collection of English collectors which included Liverpool business men and the son of a bookmaker of whom it was said that he 'must have read Vasari on the sly.' I reproduce, 9, one of the Venezianos from the Fitzwilliam, bought in Florence round about 1815 by Joseph Fuller of Chelsea. It depicts a miracle of St. Zenobius, who brought back to life a widow's son who had been trampled to death in the



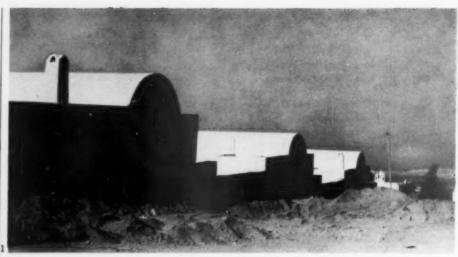
Borgo Albizzi. The despairing widow breaking out from the group of lamenting women is one of the most dramatic conceptions in the exhibition and the architectural background attaches the Borgo Albizzi to heaven.

FUNCTIONAL TRADITION

THE RESTORING HAND

The vernacular architecture of Santorin 'May survive the last wave of earthquakes but may not survive another,' said The Exploring Eye in AR, December, 1958, apprehending that conscious rebuilding with modern techniques might see the end of the local tradition. But the rebuilding of Santorin is now under way, 1, and the apprehensions of the Exploring Eye may be checked against the work of the restoring hand illustrated here from information supplied by Mr. S. Neufeld.

The reconstruction project is unusual in that, although it is sponsored by the Greek Ministry of Housing and Reconstruction, and backed up with military technical aid, the direction of the programme is in the charge of a group of architects, led by Constantine Decayalla.



Constructionally, this team have opted for a variant of the local vernacular form of vaulting, 2, that generations of modern architects have admired but had no cause to build, although a more conventional modernism, with straight beams and flat





roofs is seen in their works of privately sponsored reconstruction, 3. However, the vault-work does not follow tradition in methods and materials, and consists of thin concrete ribs with pumice-block infill, erected over de-mountable and re-usable shuttering, while the joinery-work was made in a central workshop and is largely standardized.

The forms, then, remain as they were, and the re-housed inhabitants have not undergone such a domestic architectural revolution as that of the people of Matera/La Martella, Lodovico Quaroni's celebrated UNRRA re-housing project in southern Italy (AR, August, 1958). But

1, shows the extreme simplicity and sculptural quality of Santoria

2, part of the resited and rebuilt village of Kamari on the south coast of the island. Note the use of earth colours to reduce glare in the patios.

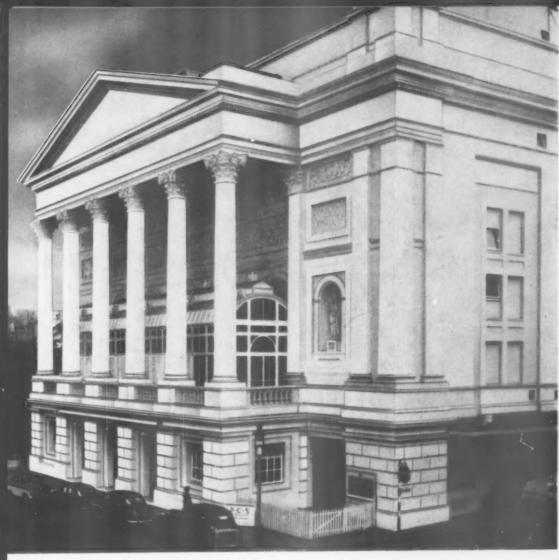
of the town by the same group of architects.

it is instructive to pursue the parallel with La Martella; in both cases the inhabitants have been moved from precipitous, densely packed and not-too-sanitary mediaeval quarters on to more level and less congested land, and there spread out only one dwelling deep—on Santorin this is a reasonable earthquake precaution.

In doing this, age-old patterns of sociability are broken up, but Quaroni and his team compensated by creating natural



social foci, group-spaces, or call them what you like, around which sociable and family relationships could re-group. On Santorin, this does not seem to be the case—much of the housing appears to be laid out borough-engineer style, 5, and the only sociable group space appears to be in the walled back yards, 6, already occupied by such things as earth-closets.



The cultural home of the Ballet and of Opera in England deserved special consideration for its decorative treatment. In 1957, and again in 1959, quality finishes supplied by The House of Williamson were chosen for the exterior decoration, and internally for the Main Foyer, Crush Bar, The Queen's Withdrawing Room and the King's Room (now used by H.R.H. Prince Philip).

These are yours for the asking.

The following Technical Bulletins are available on request:

No. 1 How soon can I decorate, and what do I use? (Treatment of new Plaster)

No. 2 Combating Corrosion—with Economy.
(Primers for Ferrous and non-ferrous metals)
No. 3 Is your Timber hungry? (Primers for Wood)

No. 4 Plumbprime — the New Master Primer. (Calcium Plumbate Primer)

The Waning of Waxing. (Interior and Exterior processes for Timber used in Modern Building Construction)

No. 6 Mastercraft Specifications. (Detailed processes for 'Makosyn' Mastercraft Enamel)

No. 7 Moisture Retardant Treatments for Timber.

(Aluminium Wood Primer)

Each Bulletin deals with its particular subject in a concise and practical manner, and offers sound and constructive advice on all surface problems. Suggested treatments are detailed, and the series as a whole gives a compact and easily understood reference to most painting problems. We shall be pleased to send you any individual Bulletin —

or the complete set - upon receipt of a postcard.

T. & R. WILLIAMSON L

Makers of Quality Paints and Varnishes since 1775.

VARNISH AND ENAMEL WORKS, RIPON, YORKSHIRE Telephone: 32 and 852. Telegrams: "Williamsons, Ripon"





FOR THE LIFE OF IT

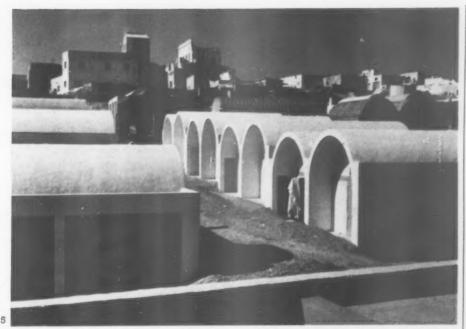
You can't put a foot wrong with LINOLEUM

Walls may have ears; but floors have their own ways of finding out things—like weaknesses in floor coverings for example.

It takes a pretty good floor covering to stand up to the constant bombardment of thousands of pairs of boots and shoes year in, year out. Modern Linoleum is tougher and more resilient than ever before. No other floor covering combines such comfort and durability with such a variety of patterns, shades, tones and effects. Modern Linoleum is your finest possible choice from the dual aspects of decorative effect and long-term economy.



"THELMA" stands for THE LINOLEUM MANUFACTURERS' ASSOCIATION, 127 VICTORIA STREET, LONDON, S.W.1.
For further information write to the Association or to any of the following members: SARBY OFTLERE & SHEFHEED LTD. Kirkcaldy - DUNDER LINOLEUM CO. LTD.
Dundee - LINOLEUM MANUFACTURISS CO. LTD., 6 Did Bailey, London, E.C.4 - MICHAEL RAIRE & CO. LTD., Kirkcaldy - SORTE BRITISH LINOLEUM CO. LTD., Dundee
SCOTTSME CO-OFERATIVE WHOLESALE SOCIETY LTD., Falkland, Fife - JAR. WILLIAMSON & SON LTD., Lancaster.





Thus the houses, while individually vernacular in appearance, are grouped and

5, shows both main house types—single cell units on the right, and two and three-roomed houses on the left. In the background are ruins of houses destroyed by the earthquake and some houses in the course of construction.
6, the back of a block of single cell units, showing external earth

crosers.
7, one of the access ways, illustrating how far the traditional scale and character have been preserved.

visually, and may also prove to be so socially, as well.

But this may be too severe a judgment on a reconstruction project whose problems are clearly well outside the experience of most western architects. The carryingthrough of such a programme with modern techniques and materials is part of an accelerating process of change that is affecting all the Greek islands, and vernacu-



lar densities might have proven too tight an urban garment for a society that is growing again for the first time in centuries. Perhaps the compromise townscape seen in 7, with its more generalized Aegean character, vernacular vaults and equally vernacular pebble-guttered road-surface, is to be welcomed as the new pattern of island urbanism. Certainly we should welcome it for all the disastrous things it might have been-packing-case prefabs in grid-iron rows, for instance-but conspicuously is not.

COUNTER-ATTACK

COLERAINE, CO. DERRY

Anyone coming fresh to Ireland must be struck by the comparative newness of the towns, especially in the North. The buildings remaining in Ulster from before the rising of 1641 are pitifully few - one or two castles, a couple of semi-fortified manors (but even these may be later), an occasional round tower, some piles of rubble that once were churches; only Armagh Cathedral of the larger medieval churches is intact (though heavily restored)-and it's commonplace enough. The successive rebellions and partial peaces which made any permanent villages continually liable to be reduced to ashes by one side or the other, gradually gave way to a more settled state with the coming of William III. The change in living habits was immediate and marked; and the real period of Irish town-building began.

It could hardly have come at a better time; and during the next 150 years, but especially at the end of the eighteenth century, a great series of towns was built over the whole province: most of them remain substantially as they were built. Some, like Armagh and Newry, have superb architecture; some make fine use of a dramatic site, like Armagh or Dungannon or Rathfriland; Enniskillen contrives to be exceptionally graceful on an incredibly cramped site; Lisburn makes proud and masterly use of all the space it can find.

Coleraine is a fairly typical Ulster town, though bigger than most, with a population getting on for 15,000. The present town, which is mainly late eighteenth- and early nineteenth-century, is actually built according to a plan laid down for a new town early in the seventeenth century when the London Companies were beginning to develop their plantations: a map of 1622 shows the shape of Coleraine much as it is today, with a large rectangular marke

















place, surrounded by a simple grid of streets enclosed within an irregular rampart and ditch. The town stands handsomely grouped on a low hill on the east bank of the River Bann. Or rather it stood: it now sprawls shapelessly everywhere with a huge ungainly suburb on the other side of the river. For Coleraine is that rare thing in Ireland at the moment, a comparatively prosperous and expanding town; and the expansion is an insult to the fine qualities of the old town.

These qualities are compactness, civility, dignity and order. The grid, which is so

dispiriting on a large flat site, works very well in Coleraine where everything is on a small scale, and where the town hall steeple can be seen from most parts of the middle of the town, 1, and acts as its natural focus, visually as well as socially. The town hall stands on an island in the market-place (called, as in many Irish towns, the Diamond—though why doesn't seem to be known), where the ground flattens out after rising from the river bank. The buildings group themselves round it to make a fine urban enclosure, 2, where most of the buildings have so far

been fairly well treated. An insurance company has set a good example with a sensitive treatment of a nice little Georgian house, 3. Modern detailing hasn't spoiled the façade, which is now harled and painted a bright grevish-green; and the lettering, though a little too small, is in a good tradition. (There is plenty more elsewhere in the town, new and old -see for example the I.T.L. Café in Queen Street, or Erwin's Bar at the top of Bridge Street.) The whole is sympathetic to the scale and freshness of detail of many of the older buildings, 4-which is more than can be said of some shop-fronts. Aside from the inevitable jam of parked cars, the square is reasonably free of clutter.

Away from the Diamond things are less happy. The east end of the town is a dismal muddle of factories, railway yards and decrepit housing. A large, featureless factory has been built on the eastern edge and is the first thing one sees of Coleraine, coming in from that side; and though some of the early industrial buildings have considerable character, 5, the general effect is very depressing, and the whole area needs drastic replanning. Nearer in, next door to the church, the modernistic 30's did their worst with a pair of ferociously ugly buildings, 6, which have now, however, been surpassed by the contemporary 50's in the shape of the deplorable new Post Office. The GPO-which shows signs in England that it knows that there is such a thing as good designshould be thoroughly ashamed.

The Post Office is on the edge of an area to the south of the Diamond which looks like becoming a slum-clearance area at any moment. A good many of the houses would doubtless be better out of the way. Others have much charm and only need a coat of paint and some internal refitting to have a much longer pleasant and useful life, 7. But whatever stays or goes, the rebuilding that will certainly come needs to be done tightly, with regard to the convenience of people wanting to live near the centre, and with respect for the buildings close by.

Good town architecture shouldn't be too much to ask for: but, looking around, one feels that nothing short of a miracle will provide it. For all the evidence Coleraine shows, there might not be an architect with a sense of style and a feeling for place in the whole of Northern Ireland. The council estates are as drab, featureless and uninteresting as one could find anywhere. though even they are a relief after the utter fatuousness of the private developers' wares. Even up to the mid-nineteenth century, 8, the Irish were building towns as good as any in Britain; now they're fumbling and scratching about to produce things which are, if possible, even worse.



Heal's Contracts bring your ideas into focus



Banking Hall of the District Bank Ltd., Newport. Architects F. R. Bates & Son.

HEAL'S CONT

196 TOTTENHAM COURT ROAD, LONDON, W.1 TELEPHONE: MUSEUM 1666

Write for our new booklet 'More Interiors' illustrating some of the work we have carried out for such well known organisations as:

BROOKE BOND AND COLTD' LIVERPOOL DAILY POST AND ECHO LTD' ALLIANCE ASSURANCE COLTD
REED PAPER GROUP' DANISH BACON COMPANY LTD' HALIFAX BUILDING SOCIETY "CANADIAN PACIFIC STEAMSHIPS LTD
THE BOWATER PAPER CORPORATION LTD' IMPERIAL CHEMICAL INDUSTRIES LTD' TRADES UNION CONGRESS
BARCLAYS BANK LTD' IND COOPE AND ALLSOPF LTD' BRITISH TRANSPORT' U.S.A.P. "JACQMAR LTD' LONDON AIRPORT

quality and service

OLIVETTE HIGH GRADE ENAMEL PAINTS

NULON SUPER EMULSION PAINTS

ARPAX EXTERIOR WATERPROOF CLADDING

were specified and used at

GOLDEN LANE HOUSING SCHEME

Architects: Chamberlin, Powell & Bon

LEIGH'S PAINTS

Sole Manufacturers

W. & J. LEIGH LIMITED

LONDON . BOLTON . GLASGOW

HANUFACTURERS OF FINE PAINTS FOR DECORATIVE AND INDUSTRIAL USE

SKILL

TIMBER ROOFING COMPONENTS

by G. C. A. Tanner

With the rise of the structural engineering profession in the early nineteenth century and the consequent need in structures for materials with precise calculable characteristics, steel ousted wood as a structural material. But during the last few years wood has been the subject of intensive research and techniques have been evolved which greatly increase its structural application. 'Timber engineering' is a phrase associated chiefly with spectacular, 'one off' structures; but quite recently a number of firms have been manufacturing standard timber structural components which aim at establishing timber as a serious alternative, in lightweight roof design, to light steel trusses, rolled steel joists and concrete planks and decking. In this article G. C. A. Tanner describes and discusses those which have so far come to his notice.

Timber used structurally is undergoing a revival. The reasons for this are many. The most significant concern advances in adhesive techconcern advances in adnesive technology, stress grading of timber and the development of metal connectors. The latter need not concern us here, but the first two are of some importance in laminated construction and plywood/solid tim-ber assemblies which are the subject of this article.

Stress grading

From the viewpoint of structural design the first difference between timber and steel is that the one is a natural material, the other is not. The properties of steel may be fairly accurately controlled. Those of timber are subject to enormous variation not only between tree species, but within the species themselves. The need to grade timber according to agreed rules is essential to avoid uneconomical design, yet stress grad-ing is comparatively new. Factors which influence grading include density, slope of grain, shrinkage, freedom from rot, termite and so on. CP 112 (1952) 'The Structural Use of Timber in Buildings' and data available from the Forest Products
Research Laboratory give effect to
this. The designer thus can assume higher stresses, resulting in a saving in material, provided he specifies his timber to accord with a particular stress grade.

Adhesives

Developments in the field of adhesives, such as the introduction of synthetic resin glues, coupled with a forward-looking attitude on the part of adhesives manufacturers has, more than anything, set the pace for advances in timber techniques. The subject of adhesives is too big to be covered comprehensively here. to be covered comprehensively but a brief outline of its history and of the types and characteristics of adhesives on the market is of adhesives possible.

Until the development of synthetic resin adhesives the common glues were manufactured from starch, offal, blood albumen and casein. The latter was most commonly used for structural purposes and blood albumen in plywood manufacture. Both unfortunately are susceptible to attack and decomposition by bacteria and moulds and their use

was thus limited to internal situations. Improvements have been made, by incorporating fungicides in casein glues to increase resistance to micro-organisms, and by adding formaldehyde to blood albumen to increase water resistance.

However, it is the development of synthetic resin adhesives in general and that group known as thermo-setting in particular which is of special value to the building industry. This group includes urea-formaldehyde, phenol-formaldehyde and resorcinol-formaldehyde resins. In each case the resin produced is the result of the reaction of formal-dehyde with the other compound.

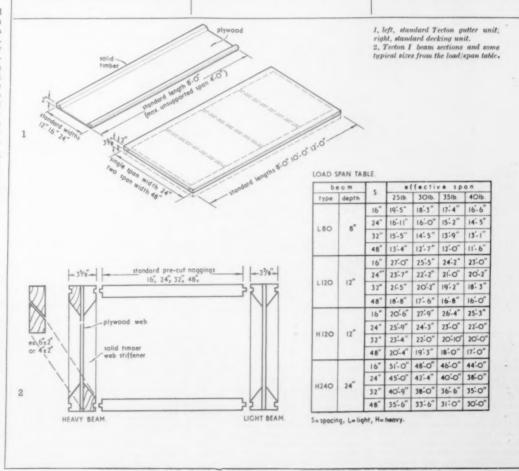
The relevant British Standard, BS 1204 'Synthetic resin, phenolic and aminoplastic adhesives for constructional work in wood' specifies these classifications.

- three classifications:—

 (1) weather and boil-proof (class WBP);
 - (2) moisture (water) and mo-

derately weather-resistant (class MR); interior (class INT.).

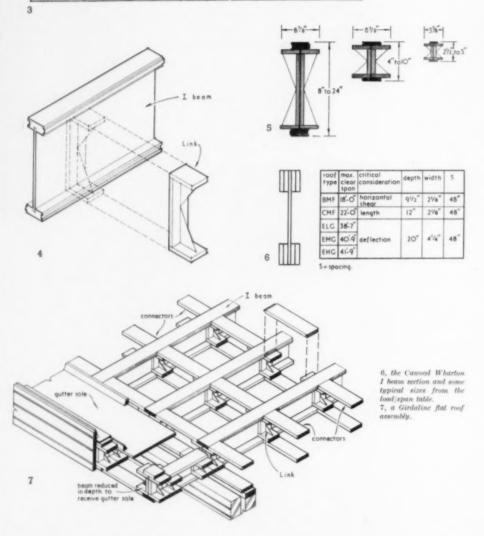
(3) interior (class INT.). In the USA casein is still widely used where the structure is fully protected from the elements. Both pure resorcinol and phenol-resorcinol resins are used for external work. In Europe common practice favours urea-formaldehyde, not only because it is much cheaper, but also because much work has been done in evolving higher grade urea-formaldehyde glues



LOAD SPAN TABLE

type		wt lbs	beam	clear spans in ft, loads as total lbs y.d i and ibs /ft sq at given beam crs.													
	qsbw	ft. run	ers.ft	10	12	14	16	18	20	22	24	26	28				
				2027	1690	1450	1266	1125	1013								
	8"	5-18	2	1013	70-5	51-8	39-6	31-3	25-3								
			3	67-9	47-0	34.6	26.4	20-8	16-8								
			4	50%	35-25	25.9	19-8	15-6	12-6								
									3120	2830	2600	2400	2230				
15	15"	6-0	2						78-0	64-3	54-2	46.0	39-8				
			3						57-8	47-8	40-3	34 - 2	29-7				
			4						39-0	32-15	27-1	23-0	19-9				
24													4250				
	24"	7-30	2										76-0				
			3										50-5				
			4										38-0				

- 3, typical sizes from the major series load span table of Newsum's Girdaline beam sections.
- 4, the Girdaline I beam and its link unit, usually spaced at 2 ft, centres.
- at 2 ft. centres.
 5, Newsum's Girdaline beam sections, left to right, major, minor and mini.



for structural work. In this country casein glues and urea and resorcinol resins are all used, but manufacturers of beams and roof systems seem to favour the resorcinol type principally because it is the only one entirely suitable for use in exposed conditions. The fact that, in most cases, the timbers are covered up and the glueline thus protected does not influence these manufacturers, who feel that

the risk of exposure, even temporarily (say during transport to the site and subsequently on the site until erected and covered up) is worth avoiding even at the extra expense of using a resorcinol resin. Other reasons, however, also influence their choice. The Forest Products Research Labora ory has cast some doubt on the ageing quality of urea resin glues as the result of long term tests. It must

be realized on the other hand that the tests carried out on a large number of proprietary urea resins show a wide diversity of performance from as little as 5 per cent loss of strength up to 60 per cent. It is hardly fair, therefore, to condemn all urea resins on the basis of an average of the above performance figures, particularly as urea resins of the gap-filling variety have been brought to a standard of efficiency suitable for structural work. As for phenol-formaldehyde there are certain difficulties in application which can result in increased labour costs and a risk of faulty joints. The fact is that each resin has its peculiarities and where there is any doubt the advice of the adhesives manufacturers themselves should be sought.

Laminated timber

Laminated construction is the process of joining layer upon layer of pieces of timber of comparatively small cross section to make up a member of a required shape, 8. It is a process of building up rather than, as is the case with solid sections, cutting down. By using stress-graded material, so that only that part of a member required to resist the highest



8, laminated beams under construction at the workshop of Gabriel, Wade & English Ltd. Southampton.

stresses will be composed of the structurally better grades, economy of material results.

material results.

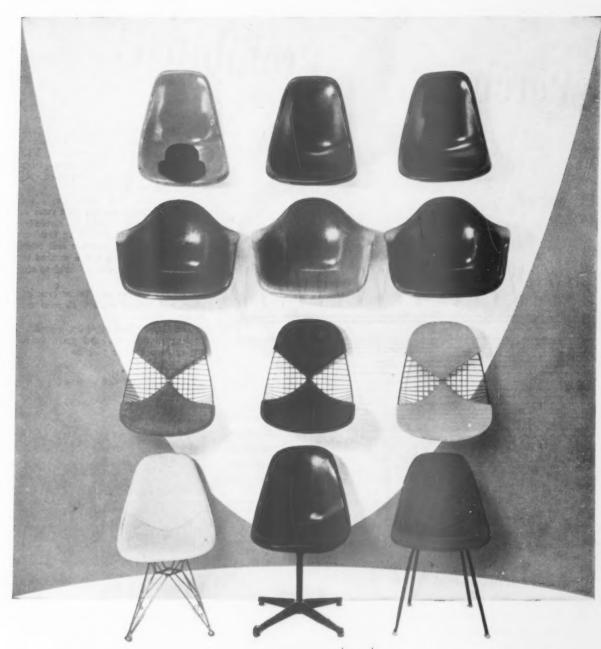
Certain rules apply in designing laminated members. For instance, where laminates are joined in their length by scarfing, the slope of cut should not exceed 1 in 12. Alternatively finger jointing may be employed but, though it wastes less material than scarfing, is not so efficient. Generally the critical position for joints is in the tension face of the member. Joints in adjacent laminates should be staggered and should be kept away from areas of maximum stress.

A number of manufacturers specialize in the construction of laminated timber beams and a list of these manufacturers is available from the TDA. Laminated beams have been used extensively by various local authorities in their school building programmes and, in the London area, there are some notable examples in schools designed by the LCC architects department. Generally beams are purpose-made for each job, as it is not usual for manufacturers to stock-pile standard sizes and lengths of beams. Variation in depth of beam for example only means the addition, or omission, of laminates.

laminates.

Laminated beams have been used over the gymnasium at Star Cross Primary School, London, to support Trofdek decking units, 16. The beams are made up of 5 in. by 1 in. laminates glued with a resorcinol-formaldehyde resin and bearing on brick walls at either end. They span 40 ft. at approximately 17 ft. 7 in. centres. Two of the beams support tracks

[continued on page 213



DESIGNS BY CHARLES EAMES FOR HERMAN

New materials and techniques are here applied to a venerable problem: sitting in comfort. Seat shells are in immensely strong polyester resin, reinforced with glass fibre, or in elegant black-enamelled wire. Upholstered clip-on covers available. Underframes are in wire, tubular steel or, in the case of the pivot chair, tubular steel on a cast aluminium base. Seats and frames are strongly, resiliently joined and you may select from many exclusive Hille upholstery fabrics.

Hille also make Herman Miller's interlocking stacking chairs, moulded plywood chairs, and the stupendous (sic) Lounge Chair and Ottoman. Visit our showrooms, 39/40 Albemarle St., London W.1, Hyde Park 9576 or 24 Albert Street, Birmingham 4, Midland 7378, or write for brochure.



Internationally-honoured furniture for homes and offices



by the Harvey Bird Baffle.

Unobtrusive, and easily fixed, the Baffle is of gutter section with rows of blunt projections formed to carefully-determined angles. It may be fitted to follow the lines of cornices and other

metal straps which can be fixed to any adjoining surface.

The fittings are of weather-resisting alloy, and devised to allow all rainwater to drain away.

architectural features, and is secured by

The Harvey Bird Baffle is the result of prolonged research, and has proved highly successful in practice.

Particularly suitable for:

ART GALLERIES,

MUNICIPAL OFFICES.

MUNICIPAL OFFICES, MUSEUMS, CHURCHES, THEATRES, FLATS, ETC.

ı

THE BLUNTED SPIKES WARN OFF, BUT DO NOT INJURE.

A statement by the Chief Veterinary Officer of a leading animal welfare organisation says:

"From what I can see of the apparatus, it is not likely to cause any harm to birds, but at the same time it should stop them roosting on ledges and copings".



Regd. Design No. 886648.

Birds will not alight on the



BIRD BAFFLE

Available in 8 ft. lengths (4 ft. of fixing strap with each length).

G. A. HARVEY & CO. (LONDON) LTD., WOOLWICH ROAD, LONDON, S.E.7

GREenwich 3232 (22 lines)

ing the property of the

SM/9

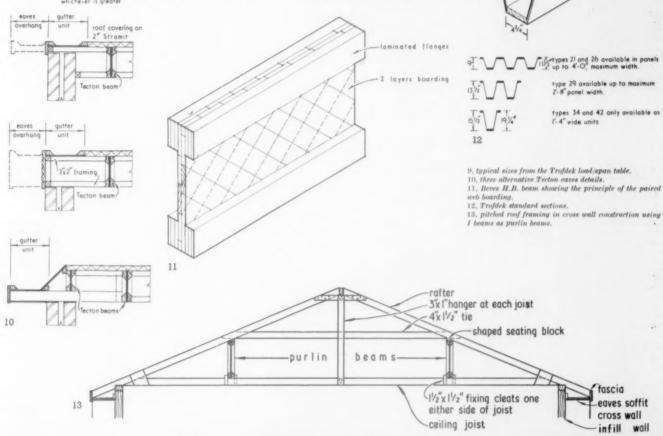
LOAD SPAN TABLE

Spans quoted in feet are clear spans and loads are quoted in lbs per sq.ft.

type	depth	wf lbs	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
21	9"	3.75	46	41	37	31	30	28	25																					
26	11/2"	400						43	39	36	33	31	28	25																
29	131/2	4 50							46	42	39	36	33	31	29	27	25													
34	151/2	4 75														36	33	31	29	28	26	25								
x42	191/4"	5 25																				37	35	33	31	30	28	27	26	25

9 a plus prefixed firrings rising to 33/4" max at centre of span

The loads shown are governed by an Ay not in excess of 0.003L ins are fibre stress not in excess of 800 lbs per sq in



continued from page 212]

from which ropes are suspended and are each 34 in. deep. The remainder are 33 in. deep. Cost of each beam was about £100. The need to carry a considerable live load from the gym ropes persuaded the architects to use beams to support Trofdek rather than have Trofdek span the 40 ft. In this case the timber construction was found to be considerably cheaper than steel but not appreciably cheaper than precast or in-situ concrete, its primary advantage over the latter being in a lower self-weight.

At Garratt Green Comprehensive Girls School laminated beams are also used, this time on a module of 3 ft. 4 in., 14. The beams are exposed on the underside and treated with three coats of alkyd varnish. All beams are 16 in. deep but vary in width from 2 in. to 6 in. according to the span, which in turn varies from 3 ft. 4 in. for the stiffeners to 53 ft. Most common spans are 13 ft. 4 in. and 26 ft. 8 in. and, as a guide to cost, the latter, supply only, were £17 13s. each. Fixing of beam to beam was carried out with steel anchor brackets.



14, laminated beams spaced on a 3 ft. 4 in module at Garratt Green Comprehensive Girls School, London

Plywood/solid timber assemblies

Like laminated members, glued plywood/solid timber assemblies in box or I beam form are built-up sections. Structurally this means that their cross section can be more closely related to the stresses normally applied than can that of a solid section where much of the material is only partially stressed.

Several manufacturers use the I beam and to a lesser extent the box beam as the basis of complete roof systems, which are described later in this article. The question

arises, sooner or later, as to when such systems may be used to economic advantage. How do they compare in cost with traditional timber construction, on the one hand, and concrete or steel on the other? Before going to the manufacturers themselves for competitive quotations the following points are worth considering. For spans up to 16 ft. and normal loadings traditional joist construction still holds its own. Beyond this and up to the limit of 50 ft. to 60 ft. spans the 'systems' should take over. Fixings are not difficult, which is a virtue of timber, and I beams or box beams will not present fixing problems with which a competent carpenter cannot cope. A typical fixing for a box beam to a timber post is shown in 15.

timber post is shown in 15.
Within the span range 18 ft. to 50 ft. the timber systems should compare more than favourably with steel (plus suspended ceilings) or concrete. They have the advantages of lighter self-weight and therefore easier handling, as well as reflecting lower foundation loads, no formwork compared with concrete, simpler fixing and much easier working in



15, seating detail of a box beam manufactured by Beees & Co. Ltd. The column is rebated 1½ in. to provide seating for the beam, the plywood sides of which are extended past the column support and screwed and glued to it.



16, laminated timber beams, spanning 40 ft, and supporting Trofilek over the gyr Cross Primary School, London. Colour variation is due to laminates of different stress-grading Beams have a matt cellulose clear finish and the underside of the Trofdek is painted black. The foreground beam is supporting a track with gym ropes,

laving out service runs and so on

All the systems are designed in accordance with CP 112 'The Struc-tural Use of Timber in Buildings'. The plywood most commonly used is Douglas Fir which is the only type available in large quantities in this country suitable for structural work. Stress grading figures are available from the Plywood Manuavailable from the Plywood Manufacturers Association of British Columbia who maintain a technical service. The Forest Products Research Laboratory of DSIR should be consulted where it is intended to use British plywoods. Their Technical Bulletins 29, 33, 39 and 42 deal with working stresses and other design. working stresses and other design information.

The following firms manufacture standard plywood/solid timber assem-

Cawood Wharton & Co. Ltd.

This firm was one of the first to produce a 'package' roof in timber. They prefer to supply and fix and their quotations include everything above plate level—beams, nogging, ceiling lining, roof decking and covering. They claim that their system is competitive with other

forms of construction over a range of spans from 18 ft. to 58 ft., 6.

The 1 beam consists of a web of exterior grade Douglas Fir plywood exterior grade Douglas Fir plywood glued to pairs of laminated flanges top and bottom. Beams are spaced at 4 ft, centres to suit standard 2 in. thick Stramit roof decking, and have prefixed firring pieces on top to provide roof falls. Solid timber noggings are cut between beams top and bottom to take roof decking and ceiling linings, the latter usually a fire-retardant fibreboard. They do not recommend plasterboard and do not recommend pasterboard and skim coat for ceilings as even a maximum allowable deflection of 0.003 x span can be considerable over long spans. Roof covering is built-up felt. An alternative decking to Stramit is & in. sheathing plywood with 1 in. fibreglass thermal insulation over the ceilings.

Dexion Ltd.

To many people the name of Dexion is synonymous with the slotted metal angle, that versatile component of any man-size Meccano set. Early last year this firm entered the field of timber engineering with existence of standard roof hearms. a system of standard roof beams, noggings, decking and gutter units known collectively as Tecton. The standard beam is an I section,

comprising a web of Douglas Fir exterior grade plywood and solid timber flanges of Pacific Coast CLS hemlock. Solid timber web stiffeners, fluinces. Sond timber web stineirs, cut from the same material as the flanges, are provided at intervals along the beam. Glue is resorcinol-formaldehyde resin. The flanges are cut from either a 6 in. by 2 in. or a 4 in. by 2 in. member, and are grooved along the side to receive the tongue of the pre-cut noggings. The cut is diagonal, so that when each half is placed against the plywood web a maximum glueline is achieved. This refinement is not common to other versions of the I beam.

The standard decking unit consists of an exterior grade plywood glued to a solid timber frame around all four sides and with stiffeners at 2 ft. centres in the length of the unit. The decking is laid with the plywood uppermost and is fixed on the site to the beams and noggings by nailing. It is made in standard widths of 24 in. (single span) and 48 in. (two



17. Tecton I beams used in flat roof constr m at Corpus Christi RC Primary muford, Essex, Pre-cut noggings f School decking are in position and in the left fore-ground are the standard gutter units. Architect, D. Plaskett Marshall.

span) and standard lengths of 8 ft., 10 ft. and 12 ft.

The standard gutter unit consists of an exterior grade plywood glued to a solid timber batten along each side of its length and is laid plywood

side of its length and is laid plywood downwards to form a trough, 17. It is made in standard widths of 12 in., 16 in. and 24 in. and a standard length of 8 ft. (see also 1).

Apart from flat roof construction Tecton I beams are recommended for use as purlin beams in pitch-roof cross wall 5, 2, 18, the usual method of seating at either and being on one of seating at either end being on concrete or m.s. angle corbels built into the brick cross walls.

H. Newsum, Sons & Co. Ltd.

This firm has been active in the field of timber engineering for some time and is probably best known to architects for its timber decking, Trofdek, described later. After a good deal of development work they introduced, towards the end of last year, a system of I beams and connectors or noggings, known col-lectively as Girdaline, 3, 4, 5.

The beam departs from the usual section of most manufacturers in



18, Tecton I beams used as purlin bea cross wall construction for housing at Ip

that the long dimension of the solid timber flanges is parallel with the neutral axis. The flange is grooved to receive the plywood web. In addition one side of each flange is grooved and the other tongued to take the ends of the connectors. A significant feature of this beam is the link or web stiffener. In fact it is more than just a rate stiffener. is the link or web stiffener. In fact it is more than just a web stiffener. Constructed from flange material it can best be described as a 'U' lying on its side with triangular plywood gussets in the internal angles, Links are normally placed at 2 ft. centres along the beam and are glued to it at the factory. Apart are glued to it at the factory. Apart from stiffening the web they act as seating and additional fixing for the top and bottom connectors. However, additional links may be supplied separately and inserted on the site for trimming to roof lights and

The beam is made in three standard depths bearing the rather curious names Major, Minor and Mini, the Major series is suitable for spans up to 49 ft. The idea behind the Girdaline section is that it may be used on its own as a structural member, and not just within the context of a standard roof system. Newsums point to its use as a purlin beam in pitch-roof cross wall construction as point.

For some years now Newsums have produced a roof unit known as Trofdek which is unique as a patent decking system in timber, the first and only one of its kind on the market. Economical for spans from 20 ft. to 40 ft. carrying normal loadings it is supplied in three basic widths on a module of 16 in. It consists of a trough or series of troughs in section rather like a blunt 'V.' The sides are plywood and fit into grooves in solid softwood members top and bottom 9, 10.

Beves & Company Limited

Recently this company were appointed the sole licensees in this country of the HB system of timber construction invented by Hilding Brosenius, of Stockholm. The HB beam is an I section comprising

laminated timber flanges and a web which consists of two layers of boards laid diagonally to the length of the beam and at right angles to each other, 11. The flange laminates are glued together, as are the two layers of web boarding, but flanges are fixed to web by means of pattern nailing. Web stiffeners are included.

To some extent plywood/solid timber beams are limited in size by standard sizes of plywood sheet, usually manufactured in 4 ft. widths. An advantage of the HB system is that no such limitations apply. Greater depth of beam can be achieved resulting in spans of up to 100 ft. The same firm also manufacture standard box and I beams.

Costs

As a rule plywood/solid timber box and I beams are cheaper than laminated timber, but require deeper sections for the same spans. Mention has already been made of the range within which the various systems of plywood/solid timber assemblies represent an economical roof construction. Generally speaking, this is in spans of from 16 ft. to 29 ft. where a complete roof including ceiling and roof covering is required.

Apart from the systems selves, however, there is no reason why virtually any of these beams should not be used in conjunction with traditional joist construction or anywhere else in which a load-bearing long-span member is required. Newsums with Girdaline (following their own precedent with Trofdek) and Beves with HB beams are the only firms apparently anxious to exploit this. Newsums publish unit prices for both Girdaline and Trofdek. In the Girdaline Major series, for example, the price per ft. run (supply only) varies from 9s. 4d. for the shallowest beam (8 in.) to 11s. 1d. for the deepest (24 in.). Trofdek prices are quoted per square foot including ply cladding and erection, but not including extras for special fixing details. The figures vary from 5s. 6d. for the 11½ in. deep section to 10s. 5½d. for the 19¼ in.

Conclusions

Visually one of the shortcomings of many of these systems is the massive fascia which results from expressing the full depth of the beam. This may not be a problem with large buildings but, on small ones the effect on scale could be serious. A little thoughtful detailing is called for and, in one or two cases, has been achieved. Choice between box and I beams usually resolves itself into a visual one. I beams allow easier fixing but a box beam more suitable where the underside

will be exposed.
Some firms, such as Cawood Wharton, prefer to supply and fix, acting as specialist sub-contractors. There is something to be said for this at the present time when, competition being keen, unreasonable quotations are not likely. In some cases developments in timber encases developments in timber engineering have been so rapid as to
outstrip field experience in the
building industry. On the other hand
other firms see the need to add new
techniques to the common pool of
building knowledge and aim to see
their product as an integral part of
the carpenter's trade. The development in standard beams, as distinct from whole roof systems, is evidence of this. Whichever approach prevails, however, the subject lends itself to standardization and the modular co-ordinators would be well advised to keep track of developments, which are likely to be rapid.



It's new! it's unique! Vetrona, the fabric made of glass

Do you know this amazing new fabric made of glass? Decoratively speaking, it is something quite unique. It is translucent, which means strikingly new and beautiful transfused light effects. But practically speaking, it offers even more! It's the easiest-to-lookafter furnishing fabric on the market. Vetrona can't absorb dirt, is easily washed by hand, and can be re-hung straight away, as it dries in minutes and never needs ironing. It won't crease, sag, stretch, rot

or go mouldy. And it's fireproof for life! If you are looking for a furnishing fabric that is something new and startling in decoration and yet has every possible practical advantage, find out about Vetrona, the fabric made of glass. In marquisettes, smooth and rough textures. In clear plain colours and exciting prints. Specially created designs can also be made for minimum lengths of two hundred yards.

Enquiries to Vetrona Fabrics Limited, Sunnyside Mills, Bolton, Lancs.

THE INDUSTRY

Colour dispensing machine

It is now common practice in America for manufacturers to use a colour dispensing machine which will mix colours on the spot to virtually any requirement. The advantage of this to the users of colours lies not so much in the quick supply of what may be a relatively out-of-the-way shade (though this, of course, is a substantial advantage) but in the fact that the shade can be exactly repeated. How many architects have accepted a colour which was not quite what they want, simply because the shade they really want would have to be specially mixed and they feared that they could not get an exact match in any further order? It is interesting to note that Walter Carson and Sons Limited have now brought this machine over here. Called the Spectromatic Dispensing Machine, it can dispense (so they claim) 1,000 different colours with perfect accuracy. Carsons are holding a series of demonstrations at different centres during the first part of 1960 and architects are asked to send in their names if they wish to receive an invitation.

mn invitation.

Walter Carson and Sons Limited,
Grove Works, Lombard Road, Battersea, London, S.W.11. Battersea 2451.

Ventilation ducts in the floor

Now that air conditioning is becoming more common in office buildings in this country, it was to be expected that the makers of hollow flooring units should tumble to the fact that, with a slight adjustment, their product could be made to serve also as a duct. In this, the

manufacturers of steel floors have an obvious advantage in that so large a proportion of their floor cross section is void. Robertson Thain Limited have taken advantage of this to introduce their Q-Air Floor. This uses their standard Q floor sections pierced on the underside to receive the main header and cross-under ducts; and on the top side to receive the junction with the room outlets. Though Robertson Thain are careful to point out that they are not themselves ventilating engineers, they will supply cross and header ducts and outlet boxes. As the additional ducts fit tight under the floor units they will not project below the structure which is supporting them and the total saving in floor-to-floor height in an air conditioned building will be quite significant and should help to make steel an economic choice.

Robertson Thain Limited, Ellesmere Port, Wirral, Cheshire.

Standard roof lights.

Of all types of window, those which lend themselves most readily to standardization are roof lights for flat roofs. It is, therefore, surprising that these have, generally speaking, been the last to receive the standard window maker's attention. One new arrival in this class is the range of standard aluminium roof lights by Quicktho Engineering Limited. These are manufactured in four sizes: 2 ft, 3 ft and 3 ft. 6 in. square, and 4 ft. by 3 ft.; and they are made both fixed and with hinged opening lights. The latter type (which we illustrate in the photograph) is pro-



vided with the now usual shield to keep out the weather when it is opened to its fullest extent. Price (including ½ in. wired cast glass) of the 2 ft. square fixed light is £7 5s., and of the 2 ft. square opening light £18 5s.

Quicktho Engineering Limited, 5 Grafton Street, London, W.1. Hyde Park 1806

Aluminium windows

It is only a very few years since aluminium windows first became popular in this country. It we are to be honest we must admit that so many of the first aluminium windows to come on the market were made to so poor a finish and with such clumsy detailing that there was a real danger that the material for all its virtues would quickly become unpopular. Later versions, however, have shown an improvement: mitres have almost attained timber joinery standards of neatness and those exceedingly visible screw heads are beginning to disappear. An entrant in the field who is making aluminium windows to this new and better standard is Heywood-Helliwell Ltd., the patent glazing manufacturers. This firm has recently marketed a new range of windows which they call 'Continental.' There is some possible confusion here since the term 'Continental' has been commonly applied to the horizontally pivotted, inside-out, type of window

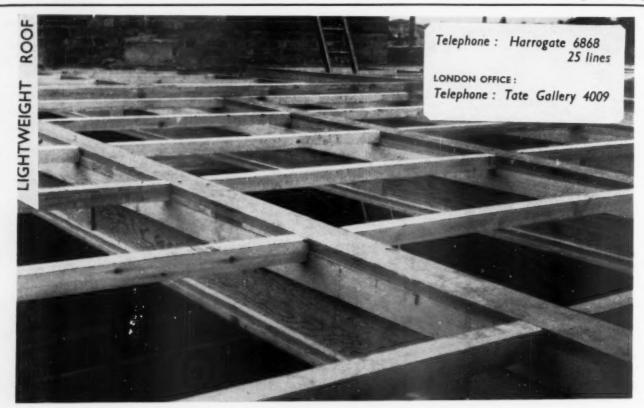
first brought to this country by Carda. Heywood-Helliwell's 'Continental' windows do include this type, but they include also vertical hung windows and traditional side hung casements. We must assume, therefore, that 'Continental' refers to the sections (which are, on the whole, more robust than those usual with British manufacturers) and not to the mode of opening. These windows are made to three specifications in an ascending scale of robustness. In all three series, corners are flash butt welded and fixing screws are concealed, while in the two heavier types the sashes close on neoprene gaskets.

Heywood-Helliwell Ltd, Bayhill Works, Huddersfield, Yorkshire.

Lightweight concrete blocks and slabs.

The Danish engineering firm of Christiani and Nielsen was one of the pioneers in lightweight concrete, manufacturing it first in 1924. They have now arranged for Celcon Limited to manufacture their products in this country. Celcon have two principle ranges of product in this field: lightweight building blocks and lightweight precast concrete slabs, both being made of pulverized fuel ash. The building blocks are 18 in. by 9 in. and in thickness from 2½ in. to 9 in.; the slabs are all 1 ft. 6 in. wide in spans up to 10 ft. and in thicknesses which are variable according to span and imposed load. Both slabs and blocks have a density of 50 lb./cu. ft.: blocks have a crushing strength of 600 p.s.i., slabs of 750 p.s.i. Lightweight p.f.a. concrete is a comparatively new product in this country: it can be cut and nailed, gives excellent fire and thermal resistance, but must be carefully

[continued on page 218



CAWOOD WHARTON & CO. LTD., SOUTHLANDS, HARROGATE

When it is essential to keep out water specify

ASPICATIONS

Complying with British Standards and "Kite" branded with the B.S.I.'s certification mark



Asphalting a new Thames Tunnel by a member company of:

THE NATURAL ASPHALTE MINE OWNERS & MANUFACTURERS COUNCIL

14 HOWICK PLACE, LONDON S.W.1. TELEPHONE: VICTORIA 1600

* FREE technical advice and literature available from the Council at 14 Howick Place, London S.W.1. Telephone: Victoria 1600

Registered



continued from page 216]

handled on site to prevent damage. In the opinion of the manufacturers, the blocks can often be left unplastered and painted, the slabs only in industrial type interiors. Celcon Limited, Universal House, 60 Buckingham Palace Road, London,

S.W.1. Sloane 0324.

More domestic windows off the

Since the last article on domestic windows was published in THE ARCHITECTURAL REVIEW there has been a Building Exhibition and a number of developments have taken place which, though minor in them-selves, promise to make a consider-able difference in the long run. Crittall are among the firms who have new things to offer and this note confined to their contribution. One such is the 'Storm Sash.' This is an aluminium window which has been designed for fitting on the inside of the firm's 'Campaigner' windows. (The 'Campaigner' is a steel window with wide frames to simulate wood.) The restriction of this idea to this particular window range was pre-sumably prompted by the fact that the 'Campaigner' has a wide surface on to which the inner window can be screwed; but there is no reason why the idea should not be extended and it seems likely that this will happen. For the purpose is not to keep storms out, but to keep the heat in;

by giving, in effect, double glazing. Crittall have now put on the market a new range of Aluminium Casement Windows covering the same sizes as their Medium Universal Steel Sections. The Aluminium Section is similar in its visual effect to the steel which prompts the question of whether the possibilities of the different material have been fully



realized; but it is interesting to note the use of a clip-on bead, of plastic glazing inserts and of plastic weatherstrips. These last can be seen on the third new product, an Aluminium Horizontal Sliding Win-dow; but in this case the weatherstrip takes the form of a long strip of nylon pile (like an unending tooth brush). For some reason the hori-zontal sliding window in aluminium has had a much happier introduction than the vertical sliding sash. The sliding window looks as though it was conceived in aluminium, the as though it is a substitute for wood

wood. The Crittall Manufacturing Company Limited, 210 High Holborn, London, W.C.1. Holborn 6612.

Patent Glazing

Of all glazing techniques, the one which has come to be called 'patent glazing' (though, presumably, it is

no longer such) is the most characteristic of this country. Though the earliest technique for glazing walls, it is far from being out-of-date and in the recent discussions on curtain walling it has emerged triumphant as one of the approaches which gives least trouble. Henry Hope have now been making patent glazing for over 70 years and there must be few, if any, snags which they have not overcome. They have now produced a very handsome book-let giving half full size details of all the established types, in lead coated steel and aluminium, for fixing to steel, concrete or timber and for north lights, span roofs, and for north lights, span roots, and for vertical glazing; for continuous open-ing, for sliding rooflights, for double glazing and for lanterns, skylights and domelights. We call this a booklet, but folio would be a better word, for it has been prepared with an almost insulting disregard for the B.S. Standard Sizes for Trade Literature. As usual with this firm, it has been carefully prepared and printed and is a first rate drawing board reference. It is obtainable free on request from Henry Hope and Sons Limited, Halford Works, Smethwick, Birmingham. Smethwick

Rearing in mind that it was only n 1948 that P. N. Youtz and Thomas B. Slick invented 'lift slab' at San Antonio, Texas, the technique has Antono, Texas, the technique has made comparatively rapid progress. But despite the visit of O'Neill Ford, the chief architect protagonist of the system, in 1951, this country has not been by any means a pioneer in the system. It is interesting to note, however, that a special con-tracting firm has now been formed

for handling the technique in Great Britain. This firm, British Lift Slab Limited, has now issued a brochure describing what the system is and what are its advantages. The ad-vantages affecting the finished product are that, since slabs are cast at ground-floor level, they can be given a sufficiently good finish to dispense with plaster; also that, since there are no projecting beams, there is usually a saving in floor to ceiling height. The chief advantages, however, are in the speed and facility of erection and in the possibilities of saving which these give. By the use of this method the process of erecting a tall building becomes something the mind can take pleasure in. The limitations in design which the system implies are little greater than those which an architect would apply to any tall building. The only visible developments in flat slab since early days is the use of slabs with voids to days is the use of sains with votas to increase spans. An example of this is the Waffle slab (see illustration) which permits spans of up to 40 ft. British Lift Slab Limited, 395 George Road, Erdington, Birmingham, 23. Birchfield 5261.



The sequence of operations in West's Shell Piling System has an important bearing on the stability of the pile.

First the precast shoe and reinforced concrete sectional shell are driven to a predetermined "set" in the load-carrying stratum and the reinforced concrete core is then cast in-situ, thus assuring stability of the pile whilst the core is not fatigued.

The system has a number of other advantages: Bearing capacity of each pile can be calculated and the toe resistance and skin friction resulting from the driving of the pile are retained.

The pile has a constant cross-section.

There is minimum shell wastage since extension while driving is a basic operation and only the top shell may have to be cut to take the bearing cap.

Please write for our latest publications

WEST'S SHELL

V. EST'S PILING & CONSTRUCTION COMPANY LIMITED

Foundation Specialists. Design and Construction in Reinforced Concrete BATH ROAD • HARMONDSWORTH • MIDDLESEX. Telephone: SKYPORT 5222 Branches in London • Bristol • Birmingham • Manchester • Glasgow

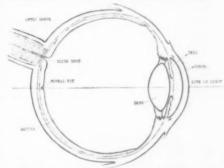
Australasia: West's ShellPiling (A/sia) Pty Ltd, Melbourne, Sydney, Adelaide & Wellington N.Z. Southern Africa: The Roberts Construction Ce.Ltd, Jehannesburg. France: Compagnie Générale de Construction de Fours, Paris. Ireland: Farrans Ltd, Dunmury, Belfast



EBEBUR

the logical use of colour in building-No. 2

Upon the properties of a square millimetre of retina with its more than 50,000 cones contained within the foveal pit is built all our measurement of colour.



Sketch of a horizontal cross section of the human eye.

colour vision

The human eye is the receiver of all colour messages. Yet mystery still surrounds even the initial light reaction in the colour receptors (the so-called "cones") of the retina of the human eye, let alone the final emergence of a colour sensation in consciousness.

There are many reasons for this state of affairs. The cones in the centre of the retina, where colour vision is at its best, are very small. This area is fitted

to give us acute vision and colour vision at the same time. Upon the properties of this square millimetre of retina, with its more than 50,000 cones, is built the measurement of colour.

Colour vision is also dynamic in nature. Some people are capable of maintaining a steady fixation or stare for long periods. Such people find that quite large differences in colour rapidly disappear when viewed steadily. It has been shown that colour vision rapidly disappears when the image is fixed on the retina. For acute vision and colour vision the eye must rove over the picture and the image pass across the retina. In other words, in visual perception an essential part is played by the movement of the image across the retina.

It is extremely probable then that a single colour is not seen by the eye and that unconscious comparisons are being made all the time.

In order to use colour satisfactorily, variety and texture, to give the moving image, must always be kept in mind. In order to emphasise the colour of an object, such as a door, it should be framed, the surround being painted another colour. Abutting colours should be avoided unless similarity of appearance is desired.

The next announcement in this series will be on "The Age Effect."

Goodlass, Wall & Co. Limited, Corn Exchange, Liverpool 2 or 179/185 Gt. Portland Street, London W.1.

COLOUR

CONTRACTORS etc

Offices, Marylebone Road, London. Architects: Gollins, Melvin, Ward & Partners. General contractors: Sir Robert McAlpine & Sons Ltd. Interior furnishing contractors: Heal's Contracts Ltd. Curtain walling, blind boxes: Williams & Williams Ltd. Glass and glazing: Clark Eaton & Co. Marblework: Walter W. Jenkins Ltd. Mosaic and terrazzo: The Alpha Mosaic & Terrazzo Co. Precast grano: Cooper Wettern & Co. Plaster and granolithic work: J. Abbott (Plasteres) Ltd. Roof paving (low block): Empire Stone Co. Roof paving (low block): Empire Stone Co. Roof paving (low block): Ruberoid Paving Co. Rubber and thermoplastic tiles: Semtex Ltd. Woodblock and strip flooring: The Philip Flooring Co. Asphalt roofing: Ragusa Asphalte Co. Mechanical services: Matthew Hall & Co. Plumbing patent solids divertor plant: Pulsometer Engineering Co. Sanitary fittings: John Bolding & Son. Kitchen equipment: Benham & Son. Metal grilles and decking: Somerville Barnard Ltd. Electrical services: Electrical Installations Ltd. Cold cathode lighting, floodlighting, main entrance hall ceiling: Ionlite Ltd. Special light fittings: Courtney Pope (Electrical) Ltd.; Frederick Thomas & Co. Internal telephones, clock system: Telephone Rentals Ltd. Joinery, doors and panelling: Samuel Elliott & Son (Reading) Ltd. Lifts: Otis Elevator Co. Roof screeds: Isocrete Ltd. Cleaning cradles: Palmers Travelling Cradle & Scaffold Co. Shopfitting (entrance halls), lift laylights

and fronts, canopy fascia and illuminated lettering, helical and main entrance hall staircases: Grundy Arnatt Ltd. Main entrance screen sandblasting: Robinson King & Co. Pneumatic messenger service: Lamson Engineering Co. Armoured fire door: Mather & Platt & Co. Fire shutters: Dennison, Kett & Co. Sliding gates: Bolton Gate Co. Access ladder and trap: Loft Ladders. Suspended ceilings: Dampa Acoustics Ltd. Roof lights: T. & W. Ide Ltd. Column guards: Huntley & Sparkes Ltd. Incinerators: Saniguard Appliances Ltd. Soap dispensers: Horton Manufacturing Co. Waterproofing: Quickset Water Sealers Ltd. Venetian blinds: J. Avery & Co. Domestic kitchen fittings: Kandya Ltd. Paints and varnishes: Goodlass Wall & Co. Internal partitioning: Holoplast Ltd. Ironmongery and lettering: G. & S. Allgood. Special glass work: The London Sandblast & Decorative Co. Cinema panelling and special fittings: The Anderson Construction Co. Cinema seating: Dawsons (Seating) Ltd. Office furniture: Shannon System Ltd. Machine room wall lining: Insulatall Ltd. External flower tubs: Mono Concrete Ltd.

Courthouse, Harlow. New Town.
Architect: Frederick Gibberd in association with Harold Conolly, Essex County Architect. General contractor: William Sindall Ltd. Sub-contractors and suppliers: Reconstructed stone: Empire Stone Co. Structural steelwork: R. O. Wright & Co. Copper roofing: Holloway Metal Roofs Ltd. Asphalt tanking and roofing: Cambridge Asphalt Co. Heating and ventilation installation: Watkin Heating Co. Court fittings and panelling:

D. Burkle & Son Ltd. Hardwood flooring: Horsley Smith & Co. (Hayes). Metal windows: James Gibbons Ltd. Marble tiling: Zanelli (London) Ltd. Terrazzo: Jaconello Ltd. Ceramic tiles: Langley London Ltd. Rubber flooring: Semtex Ltd. Hadene stone wall lining: Fenning & Co. Ironmongery: Lockerbie & Wilkinson (Birmingham) Ltd. Fibrous plaster ceilings: David Esdaile & Co. Fenetian blinds: Deans (Putney) Ltd. Lighting filtings: Harris & Sheldon Ltd.; Simplex Electric Co. Clocks: Loblite Limited. Baume & Co.; Gent & Co. The Coats of Arms were designed and made by Mr. Walter Hoyle.

Conversion in Hampstead. Architects: Howell, Killick & Partridge. Carpets, curtains, furnishing: Andrew Bruce & Co. Joinery and furniture: C. F. Kearley Ltd. Landscaping: J. E. Grant White. Tile hanging: William Smith & Evans Ltd. Asphalt roofing: Excel Asphalte Co. Thermoplastic flooring: Marley Tile Co. Balustrading: Clark Hunt & Co. Terrazzo: Zanelli (London) Ltd. Patent glazing: Faulkner Greene & Co. Plumbing: F. H. Handover Ltd. Electrical work: Dalling Electrical Contracts. Canopy lighting: Courtney Pope Ltd.

Maisonettes, Camberwell. Borough Architect: F. O. Hayes. General contractors: John Laing & Son. Sub-contractors: piling: The Pressure Piling Co. (Parent) Ltd. Heating installations, etc.: Weatherfoil Heating Systems Ltd. Lift installation: The Express Lift Co. Lightning conductors: R. S. Cutting & Co. Roller shutters: Haskins. Block names: Lettering Centre. Mosaic and tiling: Dennis M. Williams Ltd. Window fixings and fittings: Crittall Manufacturing Co. Metal workers: W. H. Gaze & Sons. Joinery: Rotherval Trading Co. Granolithic flooring: PB Industrial Flooring Co. Rubber floor tiling: Semtex Ltd. Glazing: Aygee Ltd. Celleonerete' insulation and d.p.c.: Celcon Ltd. Bituminous felt roofing: The General Asphalte Co. Landscaping: Knowles & Weller.

Hospital, Alderney, Channel Islands. Architect: Richard Llewelyn Davies. Contractor: G. Renell, Alderney. Sub-contractors: Heating: G. N. Haden & Sons. Static flooring: Phoenix Rubber Co. Ironmongers: Alfred G. Roberts Ltd. Sanitary fittings: Stitsons Sanitary Fittings Ltd. Paint: Hadfields (Merton) Ltd.; Tretol Ltd. Doors: John Sadd & Sons Furniture: Finnag Ltd.

Flats and Maisonettes, Gloucester. City Architect: J. V. Wall. General contractors: William Moss and Sons Ltd. Subcontractors: Reinforced pile foundations: Piling and Construction Co. Reconstructed stone: Cotswold Vale Co. Bricks: Star Brick and Tile Co. Joinery: J. Long and Sons Ltd. Doors: Gliksten Doors Ltd. Prefabricated plumbing: Econa Modern Products Ltd. Combined hot and cold water tanks: The Rolyat Tank Co. Thermoplastic floor tiles: Semtex Ltd. Electrical installation: Lee, Beesley and Co. Communal aerial system: British Relay Wireless Ltd. Television relay and radio relay: Link Sound and Vision Services. Metal balustrading: Hotchkiss Engineers Ltd. Felt roofing: D. Anderson and Sons Ltd. Glazing: Faulkner Greene and Co.





"ROLLS"

SLIDING AND FOLDING DOOR GEAR

FOR HANGARS

FACTORIES

SHOWROOMS, ETC.,

No. 200. SERIES FOR DOORS UP TO 2 CWT. PER LEAF

No. 300. SERIES FOR DOORS UP TO 3 CWT. PER LEAF

No. 400. SERIES FOR DOORS UP TO 4 CWT. PER LEAF

No. 400H. SERIES FOR DOORS UP TO 6 CWT. PER LEAF

No. 500. SERIES FOR DOORS UP TO 20 CWT. PER LEAF

No. 500H. SERIES FOR DOORS UP TO 30 CWT. PER LEAF

A comprehensive range of Sliding and Folding Door Gear is available for any application, from a cabinet to an aircraft hangar door. Fully illustrated literature available on request.

LONDON OFFICE

5 New Bridge Street, Ludgate Circus, E.C.4.

Tel: CITy 4815

ELLARD SLIDING DOOR GEARS Ltd., (Desk 5/5) Works Road, Letchworth, Herts.

Tel: 613/4



Remember, when kitchen planning, that the Leisure Advisory Service can be relied on for help. Leisure offer you the services of a photographic unit which will set up and photograph model kitchens for you. In this way you can get a complete picture of the kitchens you have in mind. According to your specifications of size, shape and price the Advisory Service will also suggest units to fit the kitchens you plan, so giving each an individual and made-to-measure look of quality and class. Why not write for details? Leisure experts are there to serve you.

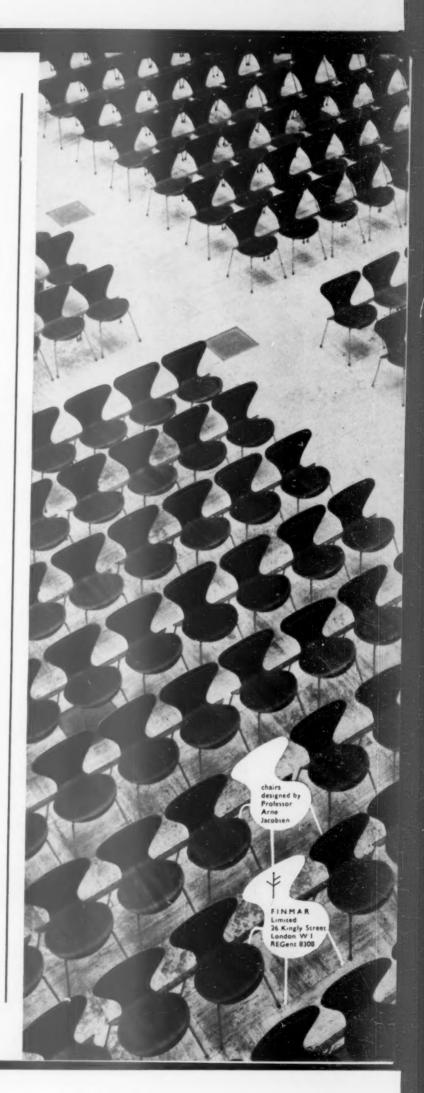




THE LEADING
NAME IN KITCHEN
EQUIPMENT



LEISURE KITCHEN EQUIPMENT LTD. Nottingham Road, Long Eaton, Nottingham. Proprietors: Allied Ironfounders Ltd.



Why WEYDEC is the 'product of the future'* for ARCHITECTS



to Architects—it is a constructional board with its plastic surface already factory bonded to a Weyroc core.

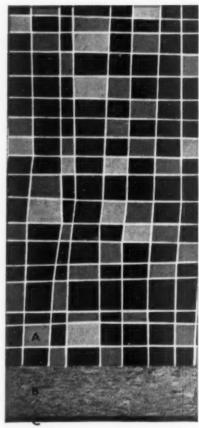
This advantage shows itself in various ways:

COMPLETE DEPENDABILITY. Basically, the value of Weydec is the strength of its Weyroc core—a first-class precision board. This means that you can specify whatever plastic-surfaced unit you want in colourful, hardwearing WEYDEC, knowing that the finished job will be entirely to your satisfaction.

COST-SAVING. Weydec saves costs in two important ways. Because it does away with the 'glue-pot', it saves your contractor time and labour. And, because a ready-bonded plastic-surfaced board costs less than buying the board and surface separately, it saves money for your client.

CHOICE. Weydec is available in a standard range of patterns for normal use—one of these attractive patterns is reproduced here.

AND STILL MORE CHOICE. In addition, you are welcome to take full advantage of our Design Service. Through this, you can have your own design or patterns from Sanderson's decorative laminating paper incorporated into the melamine surface of Weydec.



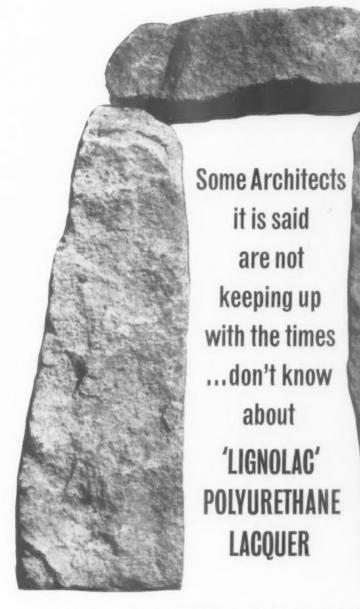
- A. This design is one of the new Weydec surfaces.
- B. The Weyroc core (4" or 2").
- C. Non-decorative plastic balancer on reverse side.

* This means from today onwards! Greatly expanded production of Weydec now makes it possible for you to get all you want. So, contact your Weydec Distributor straightaway!

IIVEIJ CE C Melamine surfaced Weyroc

Write for a free sample to:-

THE AIRSCREW COMPANY & JICWOOD LTD · Dept. AR. 16 · WEYBRIDGE · SURREY · TEL: WEYBRIDGE 2242/7







..... a totally new type of clear finish that completely supersedes all conventional materials for exterior cladding and floors.

Lignolac Polyurethane Lacquer is a two pack product consisting of base and hardener. It offers the architect a coating of exceptional hardness and great durability. Used for exterior cladding, it ensures a handsome, deep gloss finish that will withstand severe outdoor conditions with unequalled hours... has a low flame spread... efficiency; a remarkable protective

coating with outstanding resistance to water and to mild chemical action; a material in fact that few, if any, can match today.

Easily applied on the site by spray or brush, Lignolac Polyurethane Lacquer can be overcoated in 4-6 never cracks . . . and dries with a rich deep build.

FOR FLOORS TOO! Outstanding too as a floor coating - for wood, line, or tile (except PVC) - Lignolac Polyurethane Lacquer takes all the impact of wear and dirt itself, has a shining finish that stays shining for many months without polishing and a non-slip surface that will not chip, mark or flake.



BRITISH PAINTS LIMITED

PORTLAND ROAD, NEWCASTLE UPON TYNE, 2 . NORTHUMBERLAND HOUSE, 303-306 HIGH HOLBORN, LONDON, W.C.I - 31 WAPPING, LIVERPOOL Belfast, Birmingham, Bristol, Cardiff, Glasgow, Leeds, Manchester, Norwich, Plymouth, Sheffield, Southampton, Swansea and all principal towns.

This new building for Booth's Distilleries Ltd., Clerkenwell, incorporates aluminium windows made by HENRY HOPE & SONS LTD. Those on the ground floor are "customs windows" being fitted with burglar bars and hopper casements. Architects: Architects to the Distillers Co. Ltd.



TOMORROW'S WINDOWS

-already taking shape with

ALCAN

ALUMINIUM

The windows of today and tomorrow made of ALCAN aluminium are better than ever before. In their natural clean finish, or colourfully anodised they will present no problems of rust and lessen the cost of maintenance.



To the architect and designer

ALCAN aluminium means:

- Freedom to design outside the limitations of traditional raw materials
- One-piece hollow extruded sections made to intricately designed shapes never possible before
- Windows opening up new horizons in planning and design but right down-to-earth in sheer practicality



ALCAN aluminium means:

- No painting necessary
- No rusting
- Resistance to decay and corrosion
- · No warping
- No needless weight windows that are always easy to open
- Reduced maintenance cost throughout the life of the building

The advantages of aluminium are at their greatest with ALCAN aluminium. ALCAN, one of the world's largest producers, are specialists in the ingot field. To manufacturers, ALCAN specialisation means a constant, reliable source of aluminium in alloy forms exactly – consistently – suited to precise needs.



A typical example of an extrusion for aluminium

To architects and designers ALCAN specialisation makes available a vast store of technical knowledge and experience ready to be applied to any project, backed up by years of fabricating technique.

To the user of every aluminium product ALCAN specialisation means a certainty of quality and the best value that money can buy.



Hope's aluminium double-hung sliding sash windows, made entirely from extruded sections were used in this Comprehensive High School for the L.C.C. at Wandsworth.

Architects: Hening & Chitty.



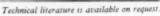
The B.O.A.C. Air Training School at Hounslow is another example of the use of aluminium windows. Here, HOPE's windows have been built into wooden frames. Architect: F. Greenwood, A.R.I.B.A.



HENRY HOPE & SONS LTD., supplied the aluminium double-hung sash windows and aluminium casement windows for the Manor Laundry, Camberwell. Architects: Stone, Thoms & Partners.

ALCAN (U.K.) LIMITED . Aluminium Canada House . 30 Berkeley Square . London W1







FIRTH-VICKERS STAINLESS STEELS LTD., SHEFFIELD

is the only company in Europe to devote its activities exclusively to the production and development of stainless and heat-resisting steels

WHEN DESIGNING THAT NEW INDUSTRIAL BUILDING YOU MUST CONSIDER THE REQUIREMENTS OF THE THERMAL INSULATION ACT*

They call for a high performance factor in thermal insulating materials. If at the same time you wish to ensure effective flame resistance, excellent light reflection and no decoration problems, then . . .



(FLAME RESISTANT INSULATION BOARD)

which has a "k" factor of 0.35, a Class I (B.S.476) rating on both surfaces (no spread of flame whatsoever), is light in weight, economic in use, easily handled and readily installed with Celotex versatile metal fixing systems...



☆ The Thermal Insulation (Industrial Buildings) Act 1957

IS THE COMPLETE ANSWER

TO CELOTEX
LIMITED
DEPT. F. NORTH CIRCULAR RD., STONEBRIDGE PARK, LONDON, N.W.IO. BLGAR 5717

N.W.10. BLGAR 5717
Please send me technical
details and a sample of your
Celotex Flame Resistant
Insulating Board. I am also
interested in bevelled panels.

NAME	
ADDRESS	1
	1

TOWN

CIIS

New Vertical Module

New Panel Range

Flush Ceilings and

Schools built in

new DERWENT

a wide choice of

Cladding Materials

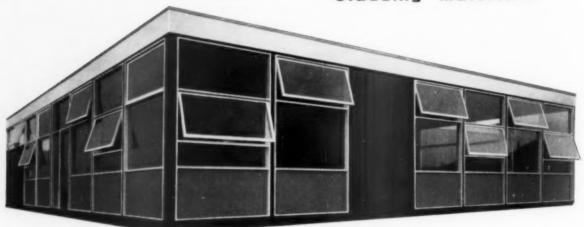


ILLUSTRATION
Additional Accommodation
at Shirebrook Grammar
School for the Derbyshire
County Council

County Architect
F. HAMER CROSSLEY
Dipl.Arch.(L'pool) F.R.I.B.A.

The new DERWENT System of Component Construction provides the Architect with a new Vertical Module which offers greater freedom of planning, a new Panel Range with an infinite number of unit combinations, Flush Ceilings and a wide choice of Cladding Materials. Competitive building costs, speedy erection and completion on time, are just a few of the advantages that the new DERWENT has over 'wet' methods of construction.

An essential part of DERWENT is the co-operation and product

quality always associated with Vic Hallam Ltd.

Write NOW for illustrated folder "The New DERWENT System."

VIC HALLAM LTD

TIMBER BUILDINGS DIVISION

LANGLEY MILL . NOTTINGHAM

TELEPHONE: LANGLEY MILL 2301-7



NEW

all contractors and consulting engineers will want to use these NEW

"HIDUTAC" SWITCHFUSES

TRIPLE POLE -TRIPLE POLE AND NEUTRAL

Men whose business it is to assess and advise are quick to appreciate the very real advantages offered by G.E.C.'s new Hidutac switchfuses. Unlimited full load switching. High breaking capacity. High fault current protection. Absolute safety. These are the performance features that the experts like so much, but they also welcome the smaller size and the good looks of this advanced range of switchfuses. As it is made by G.E.C., they naturally take its reliability for granted.





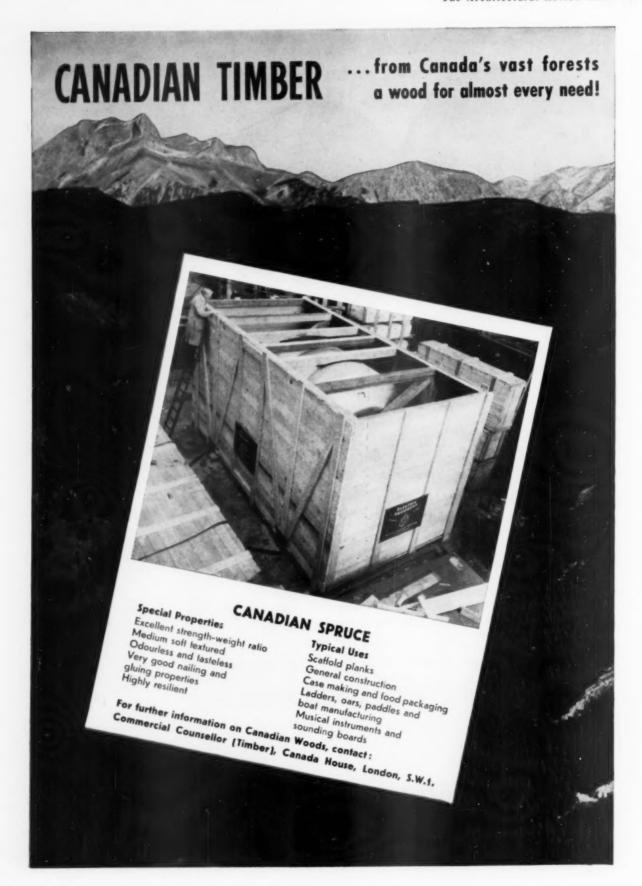
15, 30 or 60 amp. 440 volt a.c. Single Pole and Neutral, Double Pole, Triple Pole, Triple Pole and Neutral Switchfuses with interchangeable H.R.C. or rewirable fuses.



INSTALLATION EQUIPMENT GROUP

SWITCH AND FUSE GEAR · H.R.C. FUSES · OVERHEAD BUSBARS · RISING MAINS · CONDUIT · CABLE · CABLE TRUNKING · UNDERFLOOR CABLE DUCTS · ELECTRIC WIRING ACCESSORIES · BELLS

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2



DAWNAYS STEELWORK

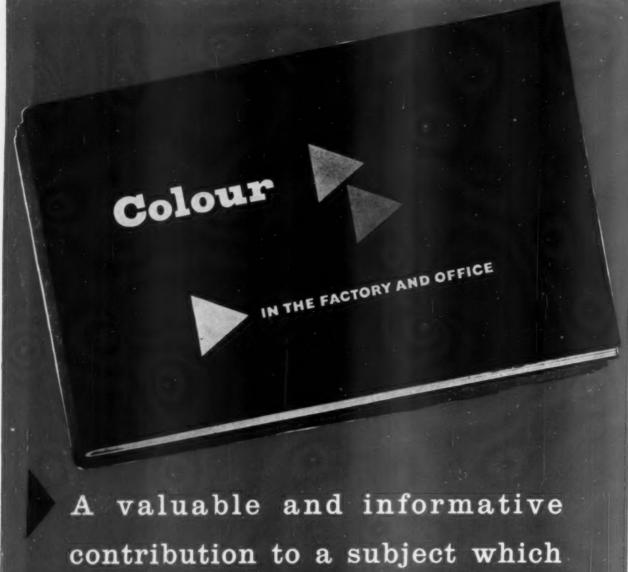
Specialists in the design fabrication and erection of riveted and welded steel-framed structures of every description



DAWNAYS LIMITED

STEELWORKS RD., BATTERSEA, LONDON, S.W.11.
Telephone BATTERSEA 2525 (10 lines)

ALSO AT: SWANSEA · CARDIFF · WELWYN GARDEN CITY · NORWICH · HULL SOUTHAMPTON · ROMFORD · VICTORIA STREET, S.W.I



A valuable and informative contribution to a subject which is increasingly engaging the attention of top management

We shall be glad to send you a copy

DOCKER BROTHERS

LADYWOOD . BIRMINGHAM 16

Please send me a copy of your brochure 'Colour in the Factory and Office'

Messrs.	
A	

AR/3/65



INTERPRETATION



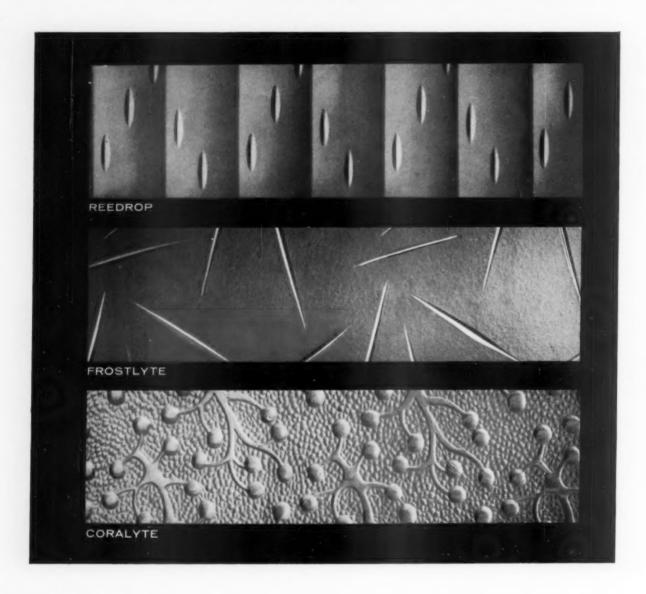
by



A. DAVIES & Co. (SHOPFITTERS) LTD.

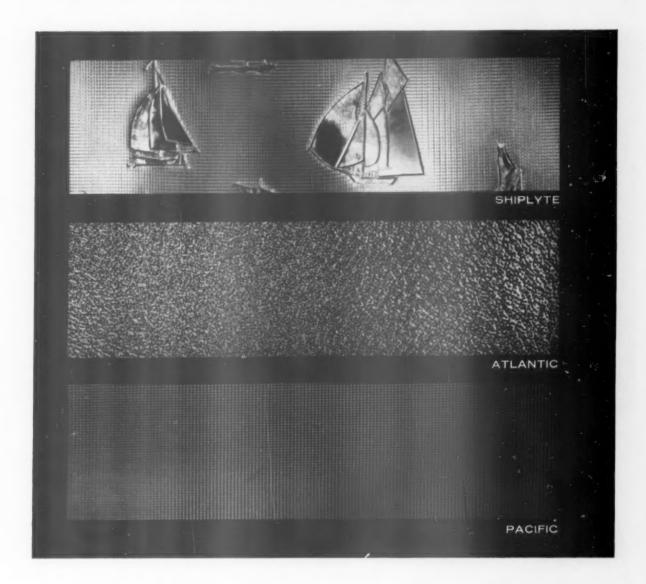
HORN LANE, LONDON W.3 'Phone: ACOrn 3444

Six new patterns of



As well as adding new decorative opportunities to the extensive range of Pilkingtons' Cathedral, Figured Rolled, Reeded and Fluted Glasses, these new patterns, with their varying degrees of obscuration have a wide range of functional applications. For full details write to Pilkingtons' Technical Sales and Service Department.

figured rolled glass



PILKINGTON BROTHERS LIMITED

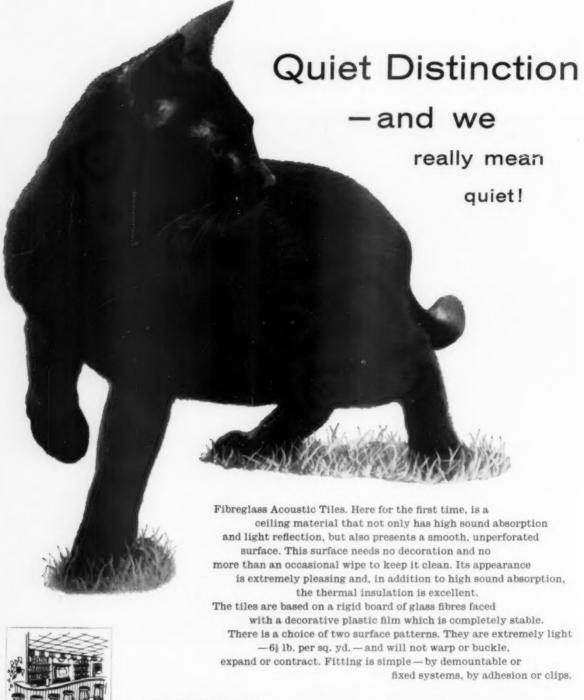
ST. HELENS · LANCASHIRE · TEL: ST. HELENS 4001



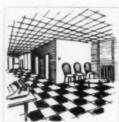
London Office: SELWYN HOUSE, CLEVELAND ROW, ST. JAMES'S, LONDON S.W.I TEL: WHITEHALL 5672-6

Supplies are available through the usual trade channels.











ACOUSTIC

Fibreglass Ltd., St. Helens, Lancs. St. Helens 4224



take a long view...

Let's face it. If you want to consider initial cost alone, there are cheaper substitutes for Ceramic Glazed Fireclay Sanitary Ware. First cost should never be the measure of real value. This is particularly true in the case of any sanitary installation. Ceramic Glazed Fireclay is sturdy, solid, strong, reliable and dependable. Its very weight will testify to that. It can never wear out, decay, rot or rust. It is impervious to grease, resistant to acids and easy to clean. And that's where price comes in. When you stop to consider that the durability of Ceramic Glazed Fireclay is such that the installation of costly replacements is virtually eliminated you begin to realise that, in the long run, it is not expensive after all. In industry, institutions, hospitals, schools, hotels; in housing schemes or any other project where sanitary installation is in question, take a long view and specify Ceramic Glazed Fireclay.



SANITARY FIRECLAY
TECHNICAL BUREAU
57, GREAT GEORGE ST. LEEDS 1



A fully illustrated booklet, published in the interest of more and better hygiene and sanitation is available on request.

SPECIFY SANITARY FIRECLAY WARE FOR PERMANENT SATISFACTION



THE NEW Della Robbia SUPER WHITE FINISH

THE WHITEST GLOSS ENAMEL IN THE WORLD!

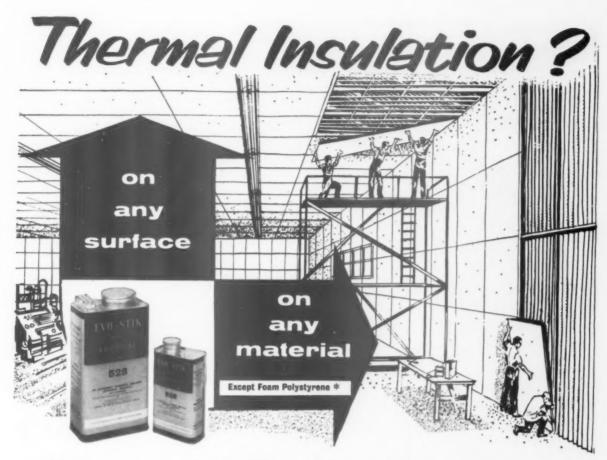
Here's the white paint to outwit and outwhite all other white paints.

Della Robbia, the whitest gloss paint which STAYS white.

A little more expensive, but what a good investment—paying rich dividends in satisfaction and permanence. Why not specify Della Robbia, just the whitest white paint for all white-painting purposes.



JENSON & NICHOLSON LTD., Jenson House, Carpenters Road, Stratford, London, E.15



Progressive People use

EVO-STIK 'Impact'

Ask Evode about Thermal Insulation. Find out now why EVO-STIK 'IMPACT' means faster, more efficient and cheaper answers to your problems of bonding. The trickiest surfaces; the widest variety of Thermal materials can be bonded permanently; at any angle, with EVO-STIK 'IMPACT'. Why waste time, money and tempers with plugs, jigs and clamps when EVO-STIK 'IMPACT' contains the answer to all your problems of bonding?

* Jablite, Polyzote, Isocolor, Flamingo, etc., for which special Evo-Stik 715 is available.

Brushes and tools can be cleaned with Evo-Stik 191 Cleaner.



EVODE LTD. (Industrial Adhesives Div.), COMMON RD., STAFFORD TEL: 2241 (5 lines)

LONDON OFFICE: 82 VICTORIA ST., S.W.I. TEL. ABBEY 4622/3/4 Manufactured in Eire by Evode Industries Ltd., Swords, Co. Dublin.



ILLUSTRATED BOOK '528—Joining in Modern Tech-

nology'. This illustrated brochure proves how a great variety of insulating materials can be bonded with less cost, less waste and more speed using Evo-Stik 'impact' adhesive.

Write for your copy please.

Please send me brochure giving technical de	tails for the
use of Evo-Stik 528 in Thermal Insulation:	
Name	
Address	
printer and the second	AR/I3

PLEASE SEND DETAILS OF 715



Sink and drainer unit made from 'Perspex' in various colours by Thermo Plastics Ltd., Dunstable

Why Thermo Plastics Limited make sink and drainer units from 'Perspex'

Sink and drainer units made from 'Perspex' acrylic sheet add beauty, cleanliness and colour to today's kitchen. So many leading manufacturers are using this outstanding plastic material for sink and drainer units—manufacturers like Thermo Plastics Ltd., Dunstable, whose unit is illustrated above.

like Thermo Plastics Ltd., Dunstable, whose unit is illustrated above.

Apart from colour—which, with 'Perspex' goes all through—look at all these other advantages offered by 'Perspex'. Sinks and drainers made from 'Perspex' will not rust, chip or corrode. They are light in weight. They are completely hygienic (one-piece moulding means no hidden germ traps). They are smooth, warm and easy to clean. They're quiet, you are unaffected by boiling water, disinfectants. too, and are unaffected by boiling water, disinfectants,

acids and household cleaning fluids.

Despite all these outstanding advantages, sinks and drainers made from 'Perspex' are available at an extremely reasonable price.

Sinks and drainers are made from 'Perspex' by

Arnoplast Ltd. ("Lustrelite"); English Rose Kitchens Ltd. ("Anemone", "Countryman"); Harold Moore & Son Ltd. ("Moorecraft"); Orbex Ltd. ("Orbit"); P& S Plastics Ltd. ("Everglos"); Peerless Built-in Furniture Ltd. ("Accylasink"); Thermo Plastics Ltd.; Troman Bros. Ltd. ("Crelene"); Wokingham Plastics Ltd.

'PERSPEX'

'Perspex' is the registered trade mark for the acrylic sheet manufactured by I.C.I.

IMPERIAL CHEMICAL INDUSTRIES LIMITED . LONDON . S.W.I



CONTRACT TO COMPLETION IN 9 WEEKS, 5 DAYS...

NEW OFFICE BLOCK FOR STANDARD—TRIUMPH DIRECTORS.

The contract for this new block of Directors' Offices for the Standard-Triumph Organisation, Coventry, was discussed and placed on 1st June, 1959. In the ensuing weeks Hills supplied and erected structural steelwork, roofs and eaves, glass curtain walling, timber cladding, entrance doors, windows, rooflights, double glass panels and venetian blinds, completing their part of the contract on 7th August following. The remaining suppliers finished on the 30th August.

Another example of the way Hills System speeds occupation date. May we send you full information?





21st JULY



Planning Eng., Sidney L. Elwood
Architect in Charge
A. G. R. Ore, Dip Arch (B'ham), A.R.I.B.A.

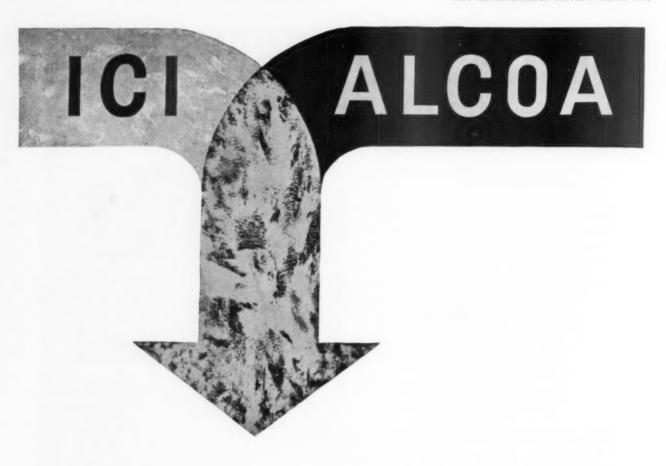
HILLS

(WEST BROMWICH) LIMITED

ALBION ROAD, WEST BROMWICH, STAFFS.
Telephone: West Bromwich 1811 (15 lines)

London: Chapone Place, Dean Street, W.1. Telephone: GERrard 0526 9 Branches at: Manchester, Bristol, Newcastle-on-Tyne, Glasgow.

@ P.10



These names make aluminium news. Imperial Chemical Industries and Aluminum Company of America, household words on both sides of the Atlantic, combine to form a new name in aluminium—IMPALCO. Backed by ALCOA's unmatched experience in the specialised field of aluminium and by I.C.L's great resources and world-wide organisation, IMPALCO will provide a new major source of aluminium.

impalco for aluminium

Imperial Aluminium Company Limited · Birmingham



Planning a kitchen P

Put in a Wastemaster

Too many 'modern' kitchens still leave the housewife to cope with messy, unhygienic sink tidies and bins. Solve the problem at the planning stage . . . by including a Wastemaster by Kenwood in your plans.

This neat, efficient appliance fits into the waste pipe under the sink . . . out of sight, saving valuable floor space. It automatically grinds up most kitchen refuse, including food scraps, small bones, vegetable peelings, tea leaves and coffee grounds. These are washed right away, preventing clogged waste pipes and drains.

Many sink units are now designed to incorporate the Wastemaster, which can also be attached to existing units. A necessity in flats and maisonettes, the Wastemaster is a requirement for every truly labour-saving kitchen.

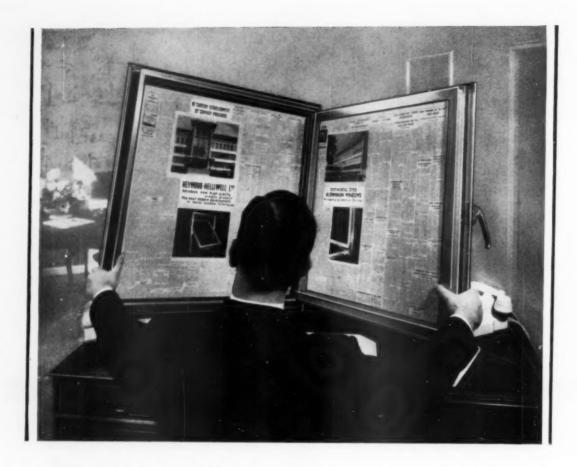
We'll gladly send you further details and specifications, and literature that will interest your clients.





enwood MANUFACTURING (WOKING) LIMITED, OLD WOKING, SURREY

WFS 155

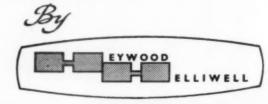


Have YOU read about the New Heywood-Helliwell Continental Aluminium Windows...the most modern development in Metal Window Technique?

- ★ The main characteristics are the perfection of detail, the very high standard of finish, and the ease and efficiency of operation.
- ★ Competent weather sealing, material protection, choice of single or double glazing, inward or outward opening, and inner or outer glazing, meets the most rigid demands of a modern lightweight metal window.

The Continental style
Aluminium Window

- ★ Hospitals, schools, flats, offices and the modern factory offer a perfect setting for these high quality windows, which form a very definite Architectural feature in structures of this type.
- ★ Write for Bulletin No. I which fully describes series A, B and C of this new Aluminium Window. The variation of this basic series offers a practical choice of application with a realistic regard to cost.



HEYWOOD - HELLIWELL LIMITED

BAYHALL WORKS . HUDDERSFIELD Tel 6594 (5 lines)



Maximum legibility and good taste are combined in the Gents wall clocks shown here.

Styled by a leading industrial designer they provide a choice of standard models which fit happily into present-day surroundings and décor.

These and others in the extensive Gents range have been selected by the Council of Industrial Design for inclusion in Design Index.

All are available for operating either on A.C. Mains or as part of a Master Clock System.





In every way... Right!

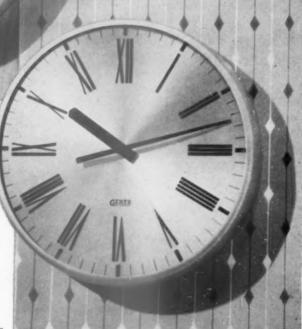
May we send you literature?

GENTS

ELECTRIC CLOCKS

GENT & COMPANY LIMITED, Faraday Works, Leicester. Telephone: 36151 London Office & Showroom: 47, Victoria Street, S.W.1. Telephone: ABBey 6888

Also WI: BIRMINGHAM. BRISTOL. EDINBURGH. GLASGOW. NEWCASTLE. BELFAST

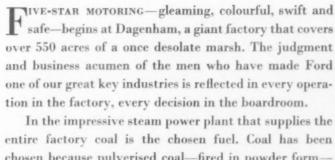


Every FORD



Progressive industry is going

starts on Coal



chosen because pulverised coal—fired in powder form—gives accurately controlled heat with the lowest fuel bills. Coal has the invaluable long-term advantage that it is a home-produced fuel which can supply all the fuel needs of British industry for decades to come.

If your voice is a deciding one in the choice of fuels

If your voice is a deciding one in the choice of fuels for your factory, remember Ford. Beneath its smokeless chimneys is a wealth of knowledge and applied experience that is an invaluable example of hard thinking and wise decisions. Ford say coal. That's five-star wisdom.



And here are some key facts and figures about the Ford main power station

Number of bollers. 4 high-pressure water-tube boilers, with superheaters, airheaters and economisers Steam pressure. 1,250 lbs. per sq. inch Steam temperature 940°F Feed temperature 380°F Continuous maximum rating. 1,000,000 lbs. of steam per hour (largest unit 400,000 lbs. per hour) Method of firing. Pulverised fuel Fuel. Coal

ISSUED BY THE NATIONAL COAL BOARD



forward on COAL



Newalls (reg'd brand) PAXTILES are the most effective method of suppressing unwanted sound; they are also a decorative treatment in themselves, capable of being painted without impairing their acoustic qualities. Composed of asbestos they are absolutely FIRE-, rot- and vermin-proof, and they resist condensation. Additionally, they provide an appreciable degree of heat insulation. It is not surprising therefore, that all these practical attributes recommend PAXTILES to the attention of modern architects as the most suitable sound insulation medium available.

mean PRODUCTION below



Newalls PAXTILES

NEWALLS INSULATION CO. LTD. WASHINGTON, CO. DURHAM A member of the TURNER & NEWALL ORGANISATION Offices and Depots at LONDON, GLASGOW, MANCHESTER, NEWCASTLE UPON TYNE, BIRMINGHAM, BELFAST, BRISTOL, DUBLIN & CARDIFF

Agents and Vendors in most markets abroad.



booth

Seating that is comfortable and convenient and tables that allow ample leg-room, resist heat and staining and are easy to clean.

That sums up a striking new range of Pel booth furniture; but there is more

to it than that. It includes two-seat or four-seat 'tip-up' units with pedestal or wall tables.

The tables are 2' 6" high, supported by a single enamel or chromium-plated column for easy cleaning and maximum leg-room. The edges are overlapped by a flush-fitting and matching plastic veneer top, heat- and stain-resistant.

The underside has a lacquer-sealed finish. Attractive colour schemes and designs are available for chair

coverings and table-tops. Full details and specifications
will gladly be sent on request

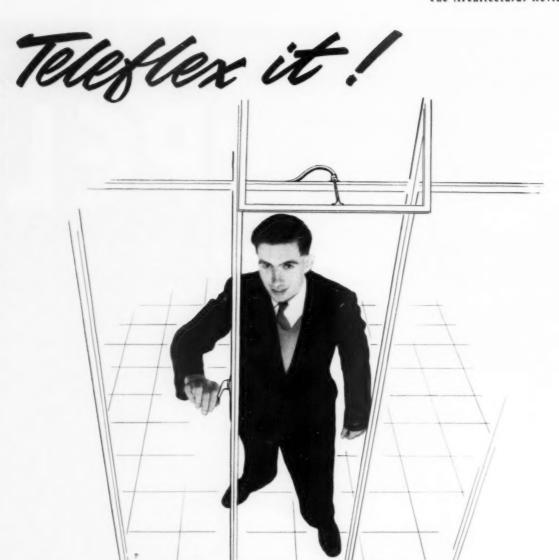
PEL LTD - A @ COMPANY - OLDBURY - BIRMINGHAM

TEL: BROADWELL 1401/6

LONDON SHOWROOMS: 15 HENRIETTA PLACE · WI · TEL: WELBECK 1874 GLABGOW SHOWROOMS: 50 WELLINGTON STREET · C2 · TEL: CENTRAL 8886



THW/







TELEFLEX solves window control problems.

Remotely – mechanically – simply – economically – unobtrusively or **completely concealed**

Sultable for all types of hung windows—
Top, Side, Bottom, Projected Top, Vertical Centre,
Horizontal Centre—and Patent Glazing, Roof Lights,
Lantern Lights, Louvres, Sliding Sashes,
Skylights, Sunbreakers, Hit and Miss Vents.

Teleflex

TELEFLEX PRODUCTS LIMITED . BASILDON . ESSEX

Telephone: Basildon 22861

Grams: TELEFLEX PHONE BASILDON



Architects: Gollins Melvin Ward & Partners

DESIGNED LIGHTING AT CASTROL HOUSE

Entrance Hall

Tower

Lift Entrances **Interior General Lighting**

MAIN FEATURES

Embodies a fully illuminated suspended ceiling with cold cathode tubes.

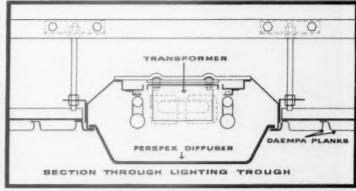
'Floodlighting' by continuous green cold cathode tubes on each floor.

Laylights illuminated by cold cathode tubes.

The DAEMPA Ceilings are fitted throughout with continuous trough cold cathode lighting and "Perspex" small diamond pattern diffusers.

The complete scheme used more than 4 miles of cold cathode fluorescent tubing!

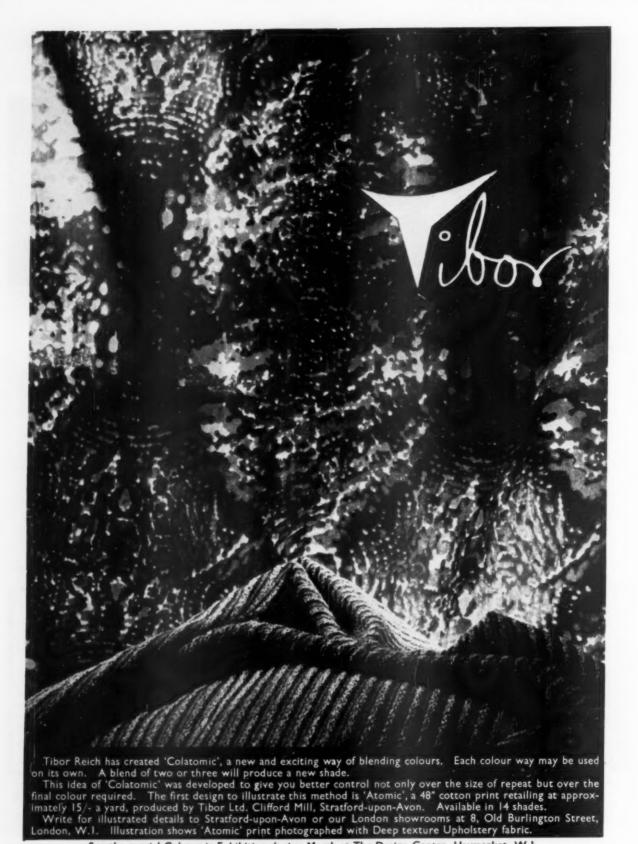




IONLITE design and install complete lighting schemes for all applications. We shall be pleased to supply quotations.

INNLITE LIMITED 89 SCRUBS LANE LONDON N.W.10

A MEMBER OF THE FALKS ORGANISATION



See the special Colatomic Exhibition during March at The Design Centre, Haymarket, W.1.



A new pattern of national distribution for Home Grown Timber

The Home Grown Timber Marketing Corporation Ltd., formed in May, 1959, is the first and only organisation for providing British industry with bulk supplies of British timber.

The activities of the Corporation comprise:-

Central Marketing

The Corporation co-ordinates supplies from its members, who are drawn from the many individual merchants comprising the Federated Home Timber Merchants' Association and the Home Grown Timber Merchants' Association of Scotland. By central marketing, the Corporation gives the industrial consumer controlled bulk delivery from as many as three hundred sawmills.

Research and Information

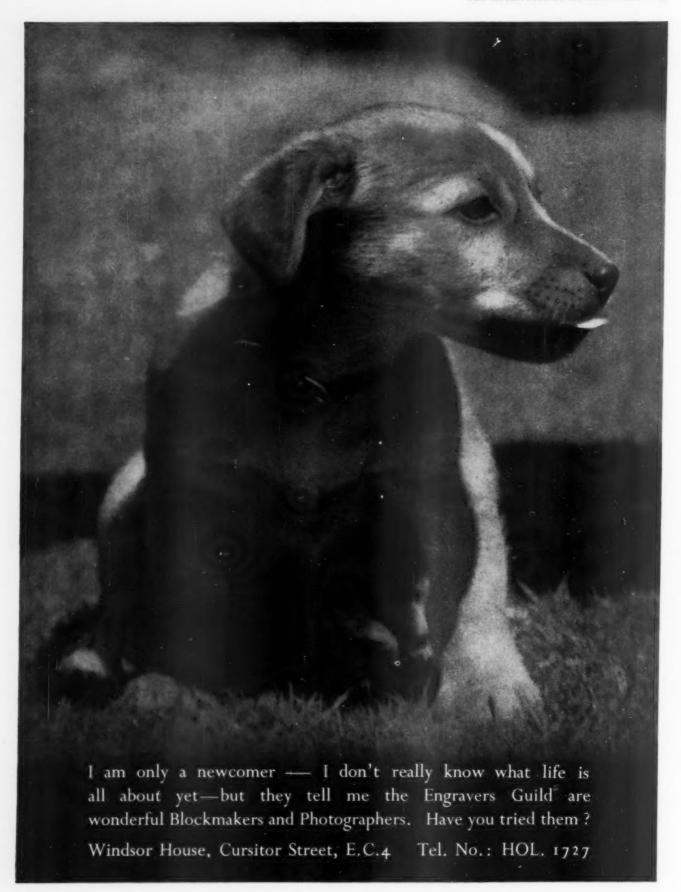
There is an extensive programme of utilisation research for home grown timber. The results of this research, together with other information, are available free and continuously through the Corporation's Information Bureau.

Corporation Control Mark

The Control Mark of the Corporation is awarded only to timber that meets the standards required by its inspectorate. It is a guarantee to the industrial consumer that he is getting home grown timber of the correct quality and type, properly processed to his requirements. delivered in the right quantity, at the right time and at a stable, economic price.

Home Grown Timber Marketing Corporation Ltd

40 BAKER STREET LONDON W. I. Telephone Hunter 2229





Architects

Messrs. Gollins, Melvin & Ward

CASTROL HOUSE

Contractors

Sir Robert McAlpine

SOME OF THE TWIDE RECTANGULAR GLASS DOMES SUPPLIED AND FIXED TO THIS CONTRACT. ALL DOMES ARE GLAZED TO SPECIALLY DEEP GREY PLATE ALUMINIUM VENTILATED CURB AND LININGS

GLASSHOUSE FIELDS RATCLIFF E1 STEPNEY GREEN 2333

ONE PIECE AND CURVED GLASS ROOFLIGHTS



Secret Formula?

No, it simply means that McKechnie have the answer to every production need. Whether extruded sections in brass, bronze, nickel silver or copper from over 20,000 dies available, or brass rods in straight lengths or coils for high speed turning and screwing, it is the consistently high quality and faultless finish of McKechnie products that has made them the choice of Industry throughout the world.



Mc KECHNIE

HIGH QUALITY

EXTRUDED SECTIONS and BRASS RODS for Industry

MCKECHNIE BROTHERS LIMITED
14 Berkeley Street, London, W.I. Telephone: Hyde Park 9841/7.
Metal Works: Middlemore Lane, Aldridge Staffs. Telephone:
ALDridge 52921
Other Factories at Widnes, London, South Africa, New Zealand.
Branch.Offices at London, Manchester, Leeds, Gloucester,

Newcastle-upon-Tyne, Glasgow (Agents J. Hood & Co.), Paris.

floors		
versus_		
fe <u>et</u>	-	

As soon as the doors of a new building are open and the activity for which it was designed begins, the battle between floors and feet is on.

A messenger boy in a hurry slides madly round corners; second-formers indulge in an energetic game of football down corridors; busy nurses move swiftly up and down aisles between the beds.

Such heavy, unsympathetic traffic demands a floor covering which suffers these attacks good-humouredly and, in fact, will always be much kinder to the feet than the feet are to the floor.

The rubber flooring tiles designed and produced by Morris Rubber Industries Ltd. combine an inbred resistance to wear with an outward appearance which looks well in all kinds of surroundings. Available in many attractive colours and patterns, warm, hygienic, quiet and resilient, Morris Rubber Tiles will satisfy the architects' need for hard-wearing floor covering wherever people work and live.

Please let us send you more detailed information about Morris Rubber Flooring and, when in London, see our exhibit at The Building Centre, 26 Store Street, W.C.I.



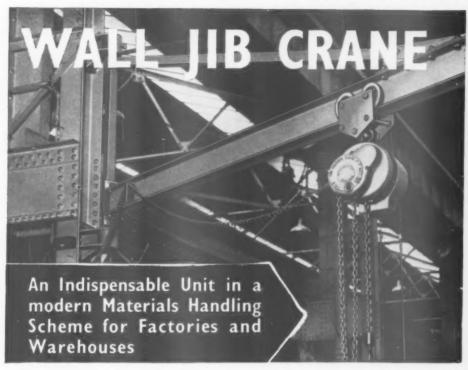
MORRIS

RUBBER INDUSTRIES LTD

HIGH ROAD . BYFLEET . SURREY

Telephone: BYFLEET 4351/3
Telegrams: RUBBER, BYFLEET





THE

TELEPHONE: EAST 2771

VAUGHAN CRANE CO., LTD. MANCHESTER 12

ONE OF MANY



LIFTING AND
HANDLING
PRODUCTS
WHICH INCLUDE

OVERHEAD TRAVELLING CRANES (UP TO 200 TONS)

HOIST BLOCKS

RUNWAYS

TELPHERS

SPECIALISED CONTROLS

Consistently the best!

You have our modern, scientifically-controlled Direct Oil-Fired Tunnel Kiln to thank for the complete uniformity and competitive prices of WINDMILL Tiles. Consistent in strength, colour and size—they are the result of advanced and highly effective production methods and conform to British Standard 1286: 1945, Type A. SPECIFY rich, dark red or brown fleck WINDMILL Quarry Tiles for your next flooring contract. Available in standard sizes and suitable for flooring Hospitals, Schools, Kitchens, Sculleries, Canteens, Dairies, etc. WINDMILL dust pressed floor tiles and fittings are also available.

A NEW "WINDMILL" PRODUCT
We have pleasure in announcing that we can now offer
CERAMIC CILLS in both Red & Brown Fleck, in
6 × 7 ± × 8
6 × 9 × 4
6 × 9 × 4



All the more reason for specifying

Send your enquiries or ask for our representative to call

THE ALLIED BRICK AND

TILE WORKS LTD.

6-7 QUEEN STREET, LONDON, E.C.4

Tele:- CITY 2725

Works at: NAPTON-ON-THE-HILL, HARROGATE AND RAMSDELL

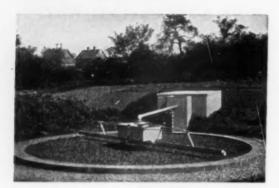
WINDMILL

QUARRY TILES

SEND NOW FOR SAMPLES AND BROCHURE

SEWAGE PURIFICATION

for Country Houses



Installation for a Housing Scheme

TUKE & BELL LTD.

London, W.C.2

0

Works: Lichfield, Staffs

The Design and Practice of Joinery

by John Eastwick-Field, B.A.ARCH.(HONS), A.R.I.B.A. and John Stillman, DIPL.LONDON, A.R.I.B.A.

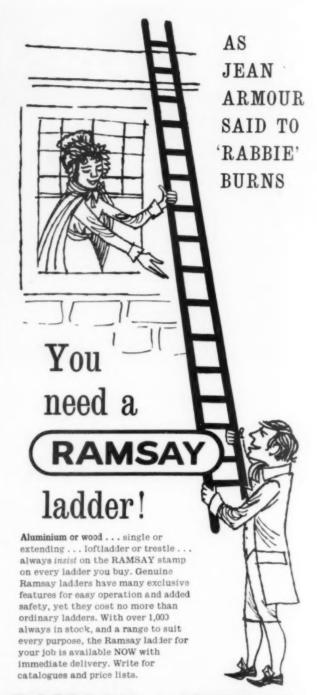
Foreword by Robert H. Matthew, C.B.E., M.A., F.R.I.B.A.

THIS, THE ONLY AUTHORITATIVE, UP-TO-DATE BOOK about present-day joinery practice, is published at the recommendation of the Text and Reference books Committee of the Royal Institute of British Architects and is intended primarily for architects, assistants and students of architecture. But, because its scope is broad and because it is concerned with the basic principles of design and practice, it will also be of great interest and value to the members of kindred professions, especially quantity surveyors, and to all who are engaged in the handling and conversion of timber, including joinery manufacturers, joiners, cabinet makers, carpenters, shop fitters and other woodworkers.

The text includes chapters on the timber yard; moisture movement in timber; an analysis of construction; the design and machining of sections; and of joints; specification and practice. Among its useful appendixes are a selection of timbers suitable for joinery, set out in tabular form, a complete list of British Standard Specifications and Codes of Practice applicable to joinery, and a general bibliography. It is comprehensively illustrated: there are nearly 90 photographs and over 200 specially drawn line illustrations—more than 80 in the chapter on joints. And there is a good index.

Size 9\(\frac{1}{2}\) by 7\(\frac{1}{2}\). 224 pages, over 290 illustrations in halftone and line, including 200 line drawings specially drawn by Robert Maguire. Price 42s. net, postage 1s. 9d.

THE ARCHITECTURAL PRESS, 9-13 Queen Anne's Gate, London, S.W.1.



RAMSAY LADDERS

RAMSAY & SONS (FORFAR) LTD. WORKS & HEAD OFFICE: FORFAR, ANGUS, SCOTLAND Tel: FORFAR 855

GLASGOW DEPOT: British Railways Mineral Yard, Kelvinbridge, South Woodside Road, Glasgow, C.4. Telephone: Western 3083 EDINBURGH DEPOT: British Railways Mineral Yard, Haymarket, Edinburgh 12. Telephone: Donaldson 1022.

LEEDS DEPOT: British Rallways Goods Yard, Whitehall Road, Leeds, 12. Telephone: Leeds 32903. LONDON AND EXPORT OFFICE: Excel House, Whitcomb Street

LONDON AND EXPORT OFFICE: Excel House, Whitcomb Street, London, W.C.2. Telephone: Trafalgar 6745.

STOCKS ARE ALSO HELD AT BELFAST & DUBLIN



Power - made to measure!

The ever-increasing demand for electricity must be met, and if this country is to survive as a prosperous and expanding industrial nation, it must be met as economically as possible.

The problem is being solved in two ways—by increased technical efficiency in normal power station operation and by development of nuclear power. New power stations, whether they burn coal or depend on nuclear energy, are progressively more and more efficient.

Coal will long continue to be our main source of power. The current surplus is only temporary. In the foreseeable future the expanding demand for power will exceed the available supply of home-produced coal. That is why Britain has a nuclear power programme which is the largest and most progressive in the world.



THE CENTRAL ELECTRICITY GENERATING BOARD

London Airport's First Hotel



welcomes
guests
with
PARKER-KNOLL

Airline passengers enjoy their comforts, so it is not surprising that the lounge of the newly-opened Skyways Hotel is furnished with a pride of Parker-Knoll chairs. Our Contract Department will be glad to send details of these and other P.K. models.

Please write for details to:
PARKER-KNOLL LTD., CONTRACT DEPT., HIGH WYCOMBE, BUCKS.
Showrooms: LONDON: 234 Tottenham Court Road, W.1. MANCHESTER:
3 Barton Square, St. Ann's Square, SRISTOL: 35 Park Street. BIRMINGHAM:
#3 Temple Street. HIGH WYCOMBÉ: The Courtyard, Frogmoor, Bucks.

We like to meet architects



We understand the furnishing fabric problems which may face a busy architect. And we know we can help.

The Old Glamis range of woven and printed fabrics is closely coordinated. Textured, patterned and plain fabrics are nicely balanced, planned to be used together. In the discreet and agreeable setting of our London or Dundee showrooms you can see the whole range in peace and plan your schemes with or without the help of trained staff, as you prefer.

AN INTERESTING SERVICE

If you need exclusive fabrics for important contracts we can provide existing designs specially dyed in colours of your choice or we can make available a range of patterns not normally displayed or available for general sale on the home market. We can produce trial lengths interpreting your ideas, provide free patterns and large samples on approbation.

Call at our showrooms if you can. If this is not possible we will gladly have the Old Glamis range brought to your office or studio.

> Roxburghe House, 287 Regent Street, London, W.1 Telephone: Mayfair 1126/7 The Old Glamis Factory, Dundee

Telephone: Dundee 85263/4





BY APPOINTMENT MAKERS OF OLD GLAMIS FURNISHING AND EMBROIDERY FABRICS TO H.M. QUEEN ELIZABETH THE QUEEN MOTHER.

OLD GLAMIS FABRICS

AIRHEAT SYSTEM

Versatile siting no piping!



Airheat Minor 250,000 B.T.U's per hour

Freedom in siting and the complete absence of water or gas pipes makes the neat, compact AIRHEAT unit the best answer to space heating problems in the factory, office, store, or home. By direct heating of the air, using a pressure type oil burner and simple heat exchanger, heat can be distributed directly or ducted all over the building. And the operating cost can be more than 50% less than that of electricity or gas!

- Guaranteed 80% thermal efficiency
- Thermostatically
- Simple installation
- Capacity up to 200,000 cu. ft.
- Can be used for cooling in summer
- Ideal for old or new buildings

Airheat Senior 600,000 B.T.U's per ho

THE AIRHEAT WASTE OIL UNIT Specially designed to use waste oil without creating maintenance problems. Similar heat output to the AIRHEAT Senior.



Unobtrusive grilles provide fresh warmed air all over the building



AIR HEATING LTD MURRAY ST PAISLEY SCOTLAND TELEPHONE: PAISLEY 3244/5 TELEGRAMS: AIRHEAT PAISLEY

London Office: 28 Victoria Street London S.W.1 Telephone: Abbey 6451

P.3272



THE HERON CHAIR

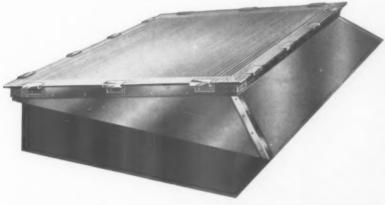


RACE

FURNITURE LONDON

Write for free illustrated list of our complete range to

22 Union Road Clapham SW4 Telephone MACaulay 2215/7



te weather protection and permanent ventilation

The Quicktho range of Roof Light

complete weather protection and permanent ventilation competitive prices — special discount for quantities immediate delivery of large or small quantities.

The Quicktho range of Roof Lights include Balanced Hinged opening Roof light as illustrated, Fixed Roof light, Access Roof light and Multi-panel Fixed Roof light.

Roof Light

Opening type is supplied factory glazed, all other types with glass, fixing screws and mastic for glazing on site.

DATA SHEETS AND PRICE LIST BY RETURN OF POST

QUICKTHO

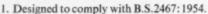
S GRAFTON STREET, LONDON, W.I

ENGINEERING LIMITED

Telephone and Telegrams: HYDe Park 1806 (5 lines)

Introducing an entirely MINIATURE FLUORESCENT LIGHTING FITTING COMPLETE WITH TWO 12-inch, 8-watt LAMPS

Consider these new and unique design features



- 2. Fully tested before and after fitting lamps.
- 3. Weatherproof and Dustproof.
- 4. Adequately protected against normal
- 5. Perspex cover, for maximum light transmission and diffusion.
- 6. Uses the latest type polyester-filled choke.
- 7. Fully power factor corrected.
- 8. Separate circuit for each lamp ensuring maximum availability.
- 9. Shrouded lampholders to accommodate lamps to American, European or British standards of tube diameter.
- 10. Lamp life 12 months or more when operated continuously.

Please see leaflet L 300 for complete details.

r a 25/40/60 u nament lamp is now used her is a vastly superior fitting for all such appl cations Lampholder (Patent applied for). Design of Fitting (Registration applied for).

VICTOR PRODUCTS (WALLSEND) LTD. WALLSEND - CN - TYNE, ENGLAND.

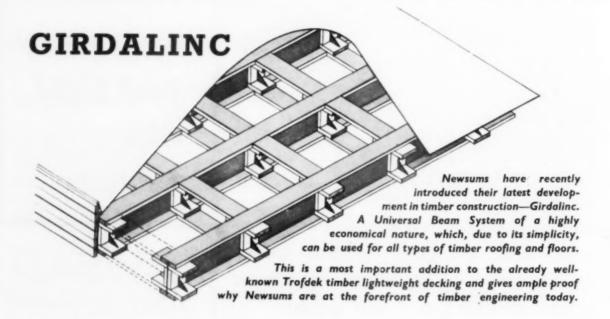
Tel: Wallsend 6831 (6 lines) Cables: 'Victor' Wallsend, England.

London Office: 132/ London Road, Norbury, S.W.16 Telephone: Pollards 8077 (3 lines)

District Office Telephone Nos: Newport 62094. Stockport 5295. Doncaster 2315. Edinburgh 53987. Chesterfield 6222.

From Wholesale Stockists throughout the British Isles.

Lichfield 2052.



H. NEWSUM SONS & CO. LTD.

TIMBER ENGINEERS

238, HIGH STREET, LINCOLN Tel. Lincoln 23284-5-6



for PROOFING plus DECOR

For the complete damp-proofing of exposed walls of concrete, stucco, brick, stone or other masonry surfaces, PLUS a most excellent decorative finish, use R.I.W. Liquid Konkerit. It sets dust-free in under six hours and will dry hard overnight in normal conditions. Available in a range of attractive gloss finishes, this R.I.W. material may be brushed or sprayed onto the surface to be proofed.

an R.I.W. product

Send for literature and details to:

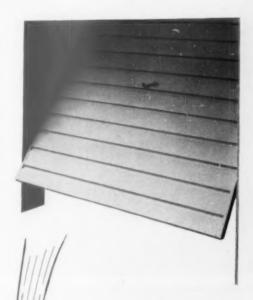
R.I.W. Protective Products Co. Ltd. 325 Whitehorse Rd., Croydon, Surrey Tel: Thornton Heath 6121/2

ANNOUNCING

The successful launching of the



GARADOR



The NEW aluminium overhead garage door.

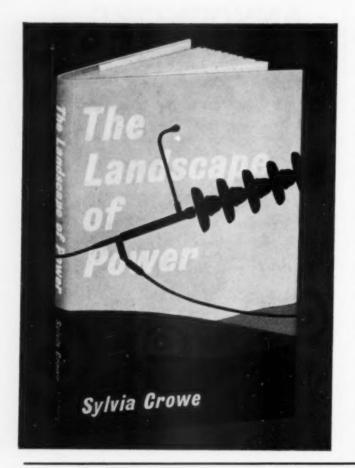
Designed to give featherlight operation easy installation and long life

NO SIDEWALL OR
ROOF FIXINGS



Write for full details to

WESTLAND ENGINEERS
YEOVIL, SOMERSET. TELEPHONE:



The Landscape of Power

by Sylvia Crowe, P.P.I.L.A.

THIS BOOK is addressed to everyone who cares about Britain's landscape. Sylvia Crowe, the eminent landscape architect, is not a preservationist. She accepts the fact that you cannot put the clock back; she accepts the essential need for the construction of immense oil refineries, nuclear reactors, power stations, and the network of the electricity grid. 'This network of power', she says, 'opens up a prospect of future wealth for the country, of clean industry and more efficient agriculture.' What she will not accept is that the introduction of these vast new structures into the landscape need necessarily ruin it, and in this practical, lucidly written handbook she calls for more thoughtfulness among those who are responsible for their construction. She shows, with text, photographs and diagrams, that giant buildings and their accessories can be incorporated in the landscape without destroying it-indeed, that given skilful design and sensitive siting they can in some circumstances enhance the natural scene.

There are nine chapters in the book and they deal with The New Industrial Age; Power and National Parks; Nuclear Power Stations; Hydro-Electric Power; Electric Transmission; Oil; Airfields; New Industries in Old Areas; Conclusion. Size 8\frac{3}{4} in. by 5\frac{1}{2} in. 116 pages including over 70 diagrams and halftone illustrations. 16s. net, postage 10d.

The Architectural Press, 9 Queen Anne's Gate, SW1





Seating installed at CASTROL HOUSE to the instructions of the architects, Messrs. Gollins, Melvin, Ward & Partners

Designed and Manufactured by

DAWSONS (SEATING) LTD.

Specialists in the supply and installation of all types of theatre, cinema and public seating. We welcome the opportunity of developing and advising on all aspects of this work.

DAWSONS (SEATING) LIMITED

32-44 CURNOCK STREET

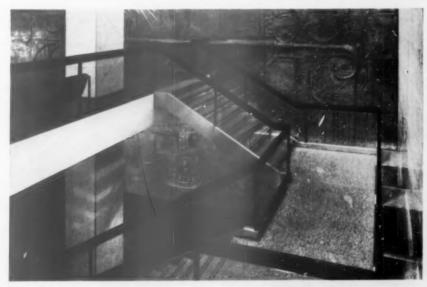
LONDON N.W.I

EUSton 8024/5

CASTROL HOUSE

Architects
Gollins, Melvin, Ward & Partners

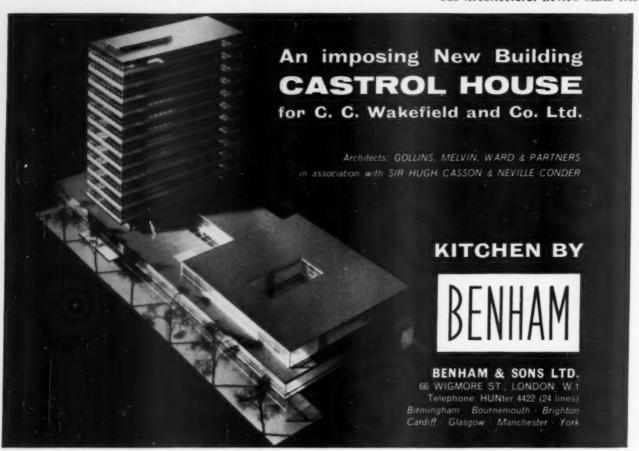
Entrance Hall Staircase in Stainless Steel with Ebonised Timber Handrails and Plate Glass Panels



Also Main Entrance Doors & Screen, Canopy Facings, Lift Fronts & Laylights, Staircase Balustrading, Circular Staircase, etc.

GRUNDY ARNATT LIMITED

SOMERSET WORKS · TEDDINGTON · MIDDX. Telephone Teddington Lock 1171-5





Harrison (Bi:mingham) Ltd., P.O. Box 233, Bradford St. Works, Birmingham, 12



Kenyons are pleased to announce the new "Kilnoise" Cellular Acoustic Tile. In harmony with traditional or contemporary decor, the tile is all mineral and can be fixed by either adhesive or mechanical suspension. Highest acoustic value and really low cost are two of the many reasons why this tile is the best. Test figures available on request.

and dimensionally stable

"KILNOISE"

CELLULAR ACOUSTIC

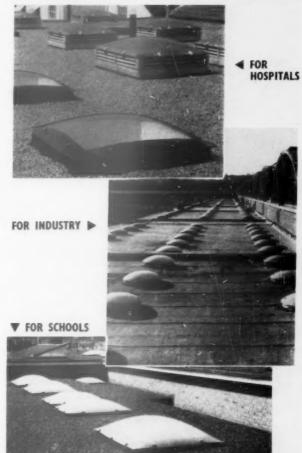
Made in England by:-

WILLIAM KENYON & SONS (MetaMica) LTD CHAPEL FIELD WORKS - DUKINFIELD - CHESHIRE

Telephone: Ashton-under-Lyne 1614/7 and 3673/6

Also at London and Glasgow

COX DOMES FOR 1960



in fact for every type of building



COX Domes for Added Light.

Virtually unbreakable, these roof lights are available in circular, square or rectangular shapes, in either clear "Perspex" (which has a light transmission of 92 per cent. as against 80 per cent. for glass), or in diffused opal for privacy and anti-glare.

For illustrated technical brochure please write to:

Williaam J. COX (SALES) Ltd.

"PERSPEX" FABRICATORS AND SHAPERS
(A.I.D. approved No. 3676/42)

559/561, Holloway Rd., London, N.19. Tel: ARCH



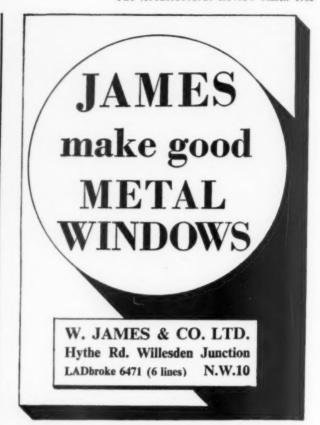
CAST BRONZE PLAQUE: SIZE: 27" x 19"

SPECIALISTS IN THE DESIGN AND MANUFACTURE OF COMMEMORATIVE PLAQUES OF ALL TYPES IN BRONZE AND BRASS

CHARLES HENSHAW AND SONS LIMITED

RUSSELL ROAD · EDINBURGH

ILLUSTRATED BROCHURE SENT ON REQUEST





SECOND INTERNATIONAL EXHIBITION OF BUILDING AND BUILDING COMPONENTS

WORLD WIDE COMPARISON OF TECHNIQUES building materials methods

housing



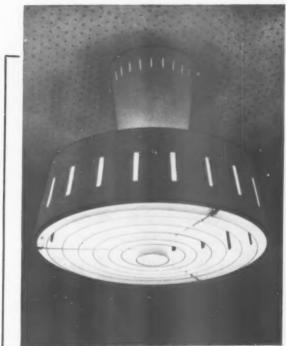
PALAIS DU C.N.I.T. Rond Point de la Defense. open 9.30 a.m. — 6.30 p.m. and until 10.0 p.m. March 22 & 25, 1960

All enquiries to the general secretariat EXPOMAT I Av. Niel Paris 17 eme. Tel. GALVANI 96-98-ETOILE 39-86.



SEND FOR ILLUSTRATED LIST

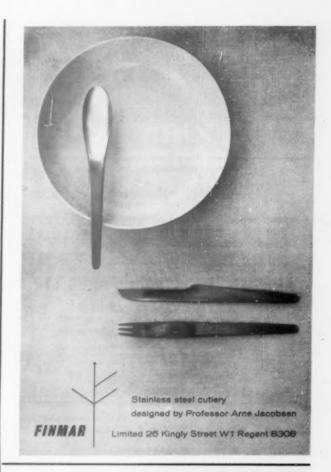
41, LONSDALE ROAD, LONDON, W.II

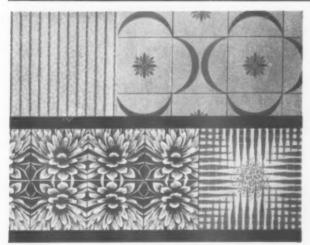


SIR

No. P354 specially designed all metal Gymnasium and Assembly Hall fitting with White enamelled reflecting surface and finished Red, Yellow, Green or Black outside. G.E.S. Porcelain lampholder for 300 w. or 500 w. lamp.

Phone: BYRON 3273/4 S.L.R. ELECTRIC LTD. Grams: Eselar, Harrow 2, PETERBOROUGH ROAD, HARROW, MIDDLESEX





TILES THAT CREATE IDEAS

MALKIN

screen printed tiles

This exciting new range of Malkin screen printed tiles is designed to give imaginative inspiration for wall decoration. Write for our illustrated leaflet and see the full range for yourself.

THE MALKIN TILES (BURSLEM) LIMITED

Burslem Stoke-on-Trent Telephone Stoke-on-Trent 87287
Members of the Glazed and Floor Tile Manufacturers Association

Exhibition model of Hydro-Electric Power Station, Fenosa-Los Peares Scheme, scale I/50th.

Made to the order of the British Thomson-

See it
BEFORE
you build:



Second thoughts can be costly when a major project is under construction. Forestall this possibility with a Bassett-Lowke true-to-scale model. A 3-dimensional model brings the whole project right into the Board Room, where problems can be finally solved and the latest developments incorporated into the design before a brick is laid—that way lies true economy.

The Bassett-Lowke brochure S.M.54 is well worth the serious attention of Executives and Purchasing Agents.

It is free of charge.

BASSETT-LOWKE LTD

Head Office and Works:

NORTHAMPTON

LONDON 112 High Holborn, W.C.I MANCHESTER: 28 Corporation Street

BUSH HOUSE Broad Street Architects

Another prominent building attractively faced

WITH HATHERNWARE FAIENCE

Send for details to Dept.A.R. HATHERNWARE LTD. LOUGHBOROUGH. LEICS. Tel: Hathern 273/4.

BERNERS STREET, W.I

PRESTIGE SHOWROOMS 18,000 FT.

TO BE LET IN THE NEW HEADQUARTERS BUILDING OF

ARTHUR SANDERSON & SONS LTD.

A rare opportunity for firms engaged in allied trades to secure first class showrooms.

Apply Sole Agents

DAVIS & CO.

62 Berners Street, W.1 Museum 8812

CLEVELAND ART METAL WORKS

S. Tabor

Established 1907

Architectural & Decorative Metalwork

Balustrades · Grilles · Lighting fittings Gates · Furniture, etc.

23 Mortimer Market, Tottenham Court Road London, W.C.1 EUSton 4169

BOOKS BOOKS BOOKS BOOKS 9

you are invited to write for our current free illustrated catalogue of books on architecture, planning and kindred subjects to THE ARCHITECTURAL PRESS 9-13 Queen Anne's Gate Westminster s.w.1

BOOKS BOOKS BOOKS BOOKS BOOKS

BOOKS



second impression

now ready

The Home of Man

by Le Corbusier and François de Pierrefeu Translated by Clive Entwistle and Gordon Holt

Size 8 ins. ×51 ins. 156 pages, containing a large number of drawings by Le Corbusier Price 15s. net (Postage 10d.)

This is the second of the two post-war books by Le Corbusier to be published in English by The Architectural Press (Concerning Town Planning was the first). In this work Le Corbusier has collaborated with François de Pierrefeu who has been closely associated with him for many years.

M. de Pierrefeu contributes the introductory text, in which he outlines the principles that should be followed in the design and planning of the towns and homes of the new world so that the resources of science are fully applied to providing the best environment for the ordinary man. Le Corbusier's section of the book follows the same theme. It consists of illustrations drawn in his own inimitable style, accompanied by his own commentary, and forms the principal contents of the book.

THE ARCHITECTURAL PRESS 9-13 QUEEN ANNE'S GATE, WESTMINSTER, SWI

The Architectural Review March 1960



Fourteen hundred years separate the building of these two land-marks—yet both faced the persistent problem of draughts. It was left to the modern techniques of the Chamberlin Weather-stripping Service to give to both these buildings the same draught-free comfort that is enjoyed in the best of modern homes. Just another example of the widely differing installations of Chamberlin Weatherstripping.

DATA SHEETS FOR ARCHITECTS AND BUILDERS

We invite Architects and Builders to send for the Chamberlin folder containing full technical data and dimensional drawings of Chamberlin equipment.

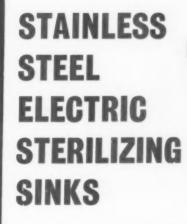


CHAMBERLIN WEATHERSTRIPS LIMITED
34 ELM ROAD, CHESSINGTON, SURREY

Telephone: Lower Hook [18]

GD109

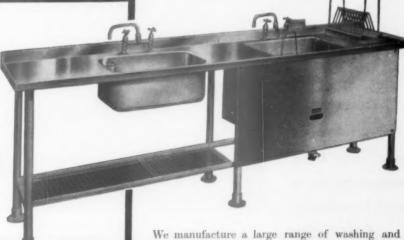




in sink or drainer units.

As illustrated or as independent sterilizers





sterilizing units and caterer's sinks to suit almost every type of kitchen, also special units made up to your own requirements. We are, therefore, able to meet your demands no matter what type of unit you may need. (Sterilizing sinks can also be made for steam or gas heating.)

THE STAINLESS STEEL SINK CO. LTD.

Head Office: RING ROAD, LOWER WORTLEY, LEEDS 12. Phone: Leeds 638711/2/3
London Office: 14, GREAT PETER STREET, LONDON, S.W.I. Phone: ABBey 1575

ALPHABETICAL LIST TO ADVERTISERS

				PAGE
Abix (Metal Indus	stries), Ltd.			exxxi
				CXX
Air Heating, Ltd. Airscrew Co. & Ji	ewood, Ltd.			Ixxxii
Alcan (U.K.), Ltd			IXXXIV, IXXXV	
Allied Brick & Til	le Works, Ltd.	200		CXVII
Allied Ironfounder				Ixviii
Alumin Building (d		alvii
Architectural Pres				en, crrrii
Associated Lead N				li.
Banister Walton &	k Co. Ltd			ii
Bassett-Lowke, Lt		112		CXXIX
Benhams & Sons,				exxvi
Bilston Foundries,				xlviii
Booth, John, & Sc	ons (Bolton), Li	d		81
Braby, Frederick,	& Co. Ltd.			xlix
Brady, G., & Co.	Ltd			1
British Paints, Lte			200	Ixxxiii
British Reinforced				INAME
Ltd	tri tri	711	144	cxxxiv
British Sanitary F			***	xcvii
Dittion Daniemy C	meetal tanastan			
Canadian Cousens	nent			xc
Canadian Governo		411	411	lii
Cape Building Pro		814		
Cawood Wharton				Ixxvi
Celotex, Ltd	Consention D.	100		lxxxvii
Central Electricity		arci		CXIX
Chamberlin Weath		127		CNNNI
Cleveland Art Met	al Works			CXXX
Colvilles, Ltd Cox & Co. (Watfor	N W. A. 111	111		XV
Cox & Co. (Watto	rd), Ltd			XXIV
Cox, Williaam J.,	(Sales), Ltd.			CENVII
Crane, Ltd				XXIII
Crittall Manufactu		516	XX	viii, xxix
Cullum, Horace W	., & Co. Ltd.	0.4.0	***	CNNXIII
Davies, A., & Co.		td.		XcIII
Davis & Co				CXXX
Dawnays, Ltd	. 600 1111	511		XCI
Dawsons (Seating),	, Ltd			CXXV
Denison French L				lxin
Denton Edwards F	aints, Ltd.			XXII
Docker Bros	A			xcii
Donald Bros., Ltd.	****		*1.1	CNX
Dorman Long, Ltd			414	Ivii
Dover, Ltd		444		xxvi
Edinburgh Weaver	s, Ltd			Ix
Ellard Sliding Door				Ixxx
Engravers Guild, L				cxiv
Evode, Ltd.	CT 100			xcix
				CXXVIII
Expomat				
Falk Stadelmann &				xlvi
Fibreglass, Ltd.	F11 911		Two.	xcvi
Finmar, Ltd.			IXX	RI, CXXIX

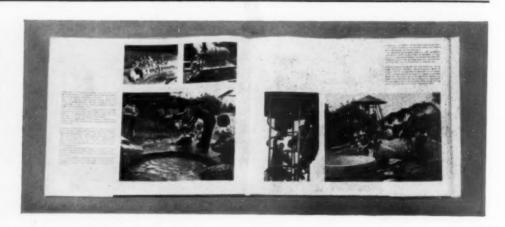
Fordham Pressings, Ltd. General Electric Co. Ltd. General Electric Co. Ltd. Gent & Co. Ltd. Gibbons, James, & Co. Ltd. Gibbons, James, & Co. Ltd. Gibbons, James, & Co. Ltd. Glazed & Floor Tile Manufacturers' Association Goodlass, Wall & Co. Ltd. Grundy Arnatt, Ltd. Hallam, Vic., Ltd. Hallam, Vic., Ltd. Harmond & Champness, Ltd. Harmond & Ghampness, Ltd. Harrisons (Birmingham), Ltd. Harrisons (Birmingham), Ltd. Harrisons (Birmingham), Ltd. Harrisons (Birmingham), Ltd. Hartersley (Ormskirk), Ltd. Heals Contracts, Ltd. Heals Contracts, Ltd. Heals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Hermescal Acoustics, Ltd. Hewwood, W. H., & Co. Ltd. Hille of London, Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hone, Henry, & Sons, Ltd. Hoperial Chemical Industries, Ltd. Inperial Aluminium Co. Ltd. Imperial Chemical Industries, Ltd. Industry, W. & Co. Ltd. James, W., & Co. Ltd.	xlviii kxiii
Fordham Pressings, Ltd. Genera Electric Co. Ltd. Gent & Co. Ltd. Gibbons, James, & Co. Ltd. Grundy Arnatt, Ltd. Hallam, Vic., Ltd. Hallam, Vic., Ltd. Harland Engineering Co. Ltd. Harrisons (Birmingbam), Ltd. Harrisons (Birmingbam), Ltd. Harresely (Ornskirk), Ltd. Hathernware, Ltd. Hathernware, Ltd. Heals Contracts, Ltd. Heals Contracts, Ltd. Hemshaw, Charles, & Sons, Ltd. Hermeseal Acoustics, Ltd. Helile of London, Ltd. Hille of London, Ltd. Hille of London, Ltd. Holcon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Hoperial Chemical Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Hoperial Aluminium Co. Ltd. Instock Brick & Tile Co. Ltd. Ideal Boilers & Rediators, Ltd. Imperial Aluminium Co. Ltd. Imperial Aluminium Co. Ltd. James, W., & Co. Ltd. James, W., & Co. Ltd.	xxxii xly lxxii cxxy xxvii yi cxxy lxxii xxxii lxxii civ lxxiii lix
Gent & Co. Ltd. Glazed & Floor Tile Manufacturers' Association Godlass, Wall & Co. Ltd. Grundy Arnatt, Ltd. Hallam, Vic., Ltd. Harmond & Champness, Ltd. Harland Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harrey, G. A., & Co. (London), Ltd. Hatheraware, Ltd. Hatheraware, Ltd. Hattersley (Ormskirk), Ltd. Hetasle Contracts, Ltd. Hetasle Contracts, Ltd. Hewsbaw, Charles, & Sons, Ltd. Hewwood, W. H., & Co. Ltd. Hills (West Bromwich), Ltd. Hills (West Bromwich), Ltd. Home Grown Timber Marketing Corporation, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hopen Henry, & Sons, Ltd. Hopenson, Ltd. Ibstock Brick & Tile Co. Ltd. Ide, T. & W., Ltd. Ideal Boilers & Radiators, Ltd. Imperial Chemical Industries, Ltd. Imperial Aluminium Co. Ltd. James, W., & Co. Ltd. Jenson & Nicholson, Ltd.	xlviii kxiii
Gibbons, James, & Co. Ltd. Glazed & Floor Tile Manufacturers' Association Goodlass, Wall & Co. Ltd. Grundy Arnatt, Ltd. Hallam, Vic., Ltd. Harland Ac Champness, Ltd. Harland Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harsters (Birmingham), Ltd. Hatstersware, Ltd. Hatstersley (Ormskirk), Ltd. Heals Contracts, Ltd. Heals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Hermesal Acoustics, Ltd. Hewwood, W. H., & Co. Ltd. Hills (West Bromwich), Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd.	Alvaine Carve In a second carv
Glazed & Floor Tile Manufacturers' Association Goodlass, Wall & Co. Ltd. Grundy Arnatt, Ltd. Hallam, Vic., Ltd. Harmond & Champness, Ltd. Harmond & Champness, Ltd. Harring Engineering Co. Ltd. Harring Engineering Co. Ltd. Harring Co. Ltd. Harring Co. (London), Ltd. Harvey, G. A., & Co. (London), Ltd. Hathernware, Ltd. Hathernware, Ltd. Heasls Contracts, Ltd. Heasls Contracts, Ltd. Heenshaw, Charles, & Sons, Ltd. Hermescal Acoustics, Ltd. Herwood, W. H., & Co. Ltd. Hills (West Bromwich), Ltd. Hills (West Bromwich), Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Ibstock Brick & Tile Co. Ltd. Ide, T. & W., Ltd. Ide, T. & W., Ltd. Ideal Boilers & Radiators, Ltd. Imperial Aluminium Co. Ltd. Imperial Chemical Industries, Ltd. Ionlite, Ltd.	XIV IXXIV CXXV VI CXXV IXXIV XXIX XXIX IXX IXX CIV IXXIII
ciation Goodlass, Wall & Co. Ltd. Grundy Arnatt, Ltd. Hallam, Vic., Ltd. Hallam, Vic., Ltd. Harmonod & Champness, Ltd. Harmond & Champness, Ltd. Harrisons (Birmingham), Ltd. Harrisons (Birmingham), Ltd. Harvey, G. A., & Co. (London), Ltd. Hathernware, Ltd. Hattersley (Ormskirk), Ltd. Hetals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Hernseal Acoustics, Ltd. Herwood, W. H., & Co. Ltd. Hills (West Bromwich), Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Hoperial Chemical Holeon, Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd.	IXXIII
Goodlass, Wall & Co. Ltd. Grundy Arnatt, Ltd. Hallam, Vic., Ltd. Hammond & Champness, Ltd. Harland Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harrisons (Birmingham), Ltd. Harvey, G. A., & Co. (London), Ltd. Harvey, G. A., & Co. (London), Ltd. Hattersley (Ormskirk), Ltd. Hetals Contracts, Ltd. Hetals Contracts, Ltd. Heushaw, Charles, & Sons, Ltd. Hermescal Acoustics, Ltd. Herwood, W. H., & Co. Ltd. Hills (West Bromwich), Ltd. Holeon, Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. Ubstock Brick & Tile Co. Ltd. Ide, T. & W., Ltd. Ide, T. & W., Ltd. Ideal Boilers & Radiators, Ltd. Imperial Aluminium Co. Ltd. Imperial Aluminium Co. Ltd. Imperial Aluminium Co. Ltd. Imperial Aluminium Co. Ltd. Imperial Chemical Industries, Ltd. Idenson & Nicholson, Ltd.	IXXIII
Grundy Arnatt, Ltd. Ix Hallam, Vic., Ltd. Ix Hannond & Champness, Ltd. Harnond & Champness, Ltd. Harland Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harrisons (Birmingham), Ltd. Hatternware, Ltd. Hatternware, Ltd. Hatternware, Ltd. Hels Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Henshaw, Charles, & Sons, Ltd. Herwood, W. H., & Co. Ltd. Hills (West Bromwich), Ltd. Holeon, Ltd. Holeon	CXXV XXVIII YI CXXV IXXII IXX XXVIII III CIV
Hallam, Vic., Ltd. Ix Hammond & Champness, Ltd. Harmond & Champness, Ltd. Harriand Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harreys, G. A., & Co. (London), Ltd. Hattersley (Ormskirk), Ltd. Hattersley (Ormskirk), Ltd. Heals Contracts, Ltd. Heals Contracts, Ltd. Hershaw, Charles, & Sons, Ltd. Hershaw, Charles, & Co. Ltd. Hills (West Bromwich), Ltd. Hills (West Bromwich), Ltd. Holoen, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Home Grown Finber Marketing Corporation, Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd.	vi exxv. lxxiv exxx lxxiv lxxiv liv civ
Haumond & Champness, Ltd. Harland Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harvey, G. A., & Co. (London), Ltd. Hattersley (Ormskirk), Ltd. Heals Contracts, Ltd. Heals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Hershaw, Charles, & Sons, Ltd. Hermeseal Acoustics, Ltd. Herwood, W. H., & Co. Ltd. Hille of London, Ltd. Hills (West Bromwich), Ltd. Holcon, Ltd. Holcon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Home Grown Timber Marketing Corporation, Ltd. Homes Grown Timber Marketing Corporation, Ltd. Holcon, Ltd. Holde, T. & W., Ltd. Holdes Beilers & Radiators, Ltd. Imperial Aluminium Co. Ltd. Imperial Aluminium Co. Ltd. Imperial Aluminium Co. Ltd. Imperial Aluminium Co. Ltd. Imperial Chemical Industries, Ltd. Islames, W., & Co. Ltd. Idenson & Nicholson, Ltd.	VI CXXV IXXIV CXXX XXXIX IXX IXX CIV CIV
Harland Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harvey, G. A., & Co. (London), Ltd. Harvey, G. A., & Co. (London), Ltd. Hathernware, Ltd. Hathernware, Ltd. Hetshaw, Charles, & Sons, Ltd. Henshaw, Charles, & Sons, Ltd. Hernsead Acoustics, Ltd. Herwood, W. H., & Co. Ltd. Hills (Mest Bromwich), Ltd. Holeon, Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd. Ltd.	VI CXXV IXXIX CXXX IXX IXX CIV IXXIII
Harland Engineering Co. Ltd. Harrisons (Birmingham), Ltd. Harrisons (Birmingham), Ltd. Harvey, G. A., & Co. (London), Ltd. Hathernware, Ltd. Hathernware, Ltd. Heathernware, Ltd. Heashaw, Charles, & Sons, Ltd. Henshaw, Charles, & Sons, Ltd. Hernsead Acousties, Ltd. Herwood, W. H., & Co. Ltd. Hills (Mest Bromwich), Ltd. Holeon, Ltd. Hone Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. ded, T. & W., Ltd. ded, Holeon, Ltd. mperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. onlife, Ltd. lames, W., & Co. Ltd. eenson & Nicholson, Ltd.	IXXIV
Harvey, G. A., & Co. (London), Ltd. Hathernware, Ltd. Hatternsley (Ormskirk), Ltd. Heals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Hernshaw, Charles, & Sons, Ltd. Hernsware, Ltd. Hernsware, Ltd. Hernsware, Ltd. Hernsware, Ltd. Hernsware, Ltd. Hernsware, Ltd. Hower, Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. Hotelon, Ltd. Hotelon, Ltd. Hoperial Chemical Industries, Ltd. Hoperial Chemical Industries, Ltd. Hoperial Chemical Industries, Ltd. Homperial Chemic	IXXIX XXXIX IXXI IXXIII CIV IXXIII
Hattersley (Ormskirk), Ltd. Heals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Hernshaw, Charles, & Sons, Ltd. Hernshaw, Charles, & Sons, Ltd. Hernswad, Mr. H., & Co. Ltd. Hills (Moodon, Ltd. Hills (West Bromwich), Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. deal Boilers & Radiators, Ltd. mperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. ames, W., & Co. Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	IXX IXX IXX IIV CIV IXXIII
Hattersley (Ormskirk), Ltd. Heals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Henshaw, Charles, & Sons, Ltd. Hershaw, Charles, & Sons, Ltd. Herwood, W. H., & Co. Ltd. Hills (Moodon, Ltd. Hills (West Bromwich), Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. dela Boilers & Radiators, Ltd. mperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. ames, W., & Co, Ltd. lenson & Nicholson, Ltd.	IXX IXX IXX IIX CIV IXXIII
Hattersley (Ormskirk), Ltd. Heals Contracts, Ltd. Henshaw, Charles, & Sons, Ltd. Hernshaw, Charles, & Sons, Ltd. Hernshaw, Charles, & Sons, Ltd. Hernswad, Mr. H., & Co. Ltd. Hills (Moodon, Ltd. Hills (West Bromwich), Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. deal Boilers & Radiators, Ltd. mperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. ames, W., & Co. Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	Ixx Iiv civ Ixxiii
leals Contracts, Ltd. lenshaw, Charles, & Sons, Ltd. lermeseal Acoustics, Ltd. lermeseal Acoustics, Ltd. levwood, W. H., & Co. Ltd. lille of London, Ltd. lills (West Bromwich), Ltd. lolcon, Ltd. lolcon, Ltd. lome Grown Timber Marketing Corporation, Ltd. lope, Henry, & Sons, Ltd. lumasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. mperial Aluminium Co. Ltd. mperial Aluminium Co. Ltd. ames, W., & Co. Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	liv civ Ixxiii
denshaw, Charles, & Sons, Ltd. derrmescal Acoustics, Ltd. dervwood, W. H., & Co. Ltd. dilvwood, W. H., & Co. Ltd. dilvwood, W. H., & Co. Ltd. dilie of London, Ltd. dilie of London, Ltd. dilie of London, Ltd. done Grown Timber Marketing Corporation, Ltd. done Grown Timber Marketing Corporation, Ltd. dope, Henry, & Sons, Ltd. dumasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. deal Boilers & Radiators, Ltd. mperial Chemical Industries, Ltd. onlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	liv civ Ixxiii
Mermeseal Acoustics, Ltd. Herwood, W. H., & Co. Ltd. Hille of London, Ltd. Hills (West Bromwich), Ltd. Holcon, Ltd. Holcon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Ltd. Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. mperial Aluminium Co. Ltd. mperial Aluminium Co. Ltd. mperial Aluminium Co. Ltd. ames, W., & Co. Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	liv civ lxxiii
deywood, W. H., & Co. Ltd. dille of London, Ltd. dills (West Bromwich), Ltd. dolcon, Ltd. dome Grown Timber Marketing Corporation, Ltd. dope, Henry, & Sons, Ltd. dumasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. deal Boilers & Radiators, Ltd. mperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. onlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	lxxiii
Hille of London, Ltd. Hills (West Bronwich), Ltd. Holcon, Ltd. Holcon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. Mperial Aluminium Co. Ltd. Mperial Aluminium Co. Ltd. Mperial Aluminium Co. Ltd. Monlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	lxxiii
Hills (West Bromwich), Ltd. Holeon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. dela Boilers & Radiators, Ltd. mperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. onlite, Ltd. lames, W., & Co. Ltd. eenson & Nicholson, Ltd.	
Holcon, Ltd. Home Grown Timber Marketing Corporation, Ltd. Ltd. Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. Marketing Corporation Ltd. Minperial Aluminium Co. Ltd. Minperial Aluminium Co. Ltd. Minperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. onlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	C
bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. mperial Aluminium Co. Ltd. mperial Aluminium Co. Ltd. conlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	xxvi
bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. mperial Aluminium Co. Ltd. mperial Aluminium Co. Ltd. conlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	
Hope, Henry, & Sons, Ltd. Humasco, Ltd. bstock Brick & Tile Co, Ltd. de, T. & W., Ltd. deal Boilers & Radiators, Ltd. mperial Aluminium Co, Ltd. mperial Chemical Industries, Ltd. onlite, Ltd. lames, W., & Co, Ltd. enson & Nicholson, Ltd.	cxiii
bstock Brick & Tile Co. Ltd. de, T. & W., Ltd. de, T. & W., Ltd. del Boilers & Radiators, Ltd. mperial Aluminium Co. Ltd. mperial Alemical Industries, Ltd. onlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	XXXIV
bstock Brick & Tile Co, Ltd. de, T, & W., Ltd. deal Boilers & Radiators, Ltd. mperial Aluminium Co, Ltd. mperial Chemical Industries, Ltd. onlite, Ltd. lames, W., & Co, Ltd. enson & Nicholson, Ltd.	XIII
de, T. & W., Ltd. deal Boilers & Radiators, Ltd. mperial Aluminium Co. Ltd. mperial Chemical Industries, Ltd. onlite, Ltd. ames, W., & Co. Ltd. enson & Nicholson, Ltd.	33.20
deal Boilers & Radiators, Ltd	Ixi
deal Boilers & Radiators, Ltd	CXV
mperial Chemical Industries, Ltd onlite, Ltd ames, W., & Co. Ltd es	iv, Iv
onlite, Ltd	cii
onlite, Ltd	0
enson & Nicholson, Ltd	cxi
enson & Nicholson, Ltd	xviii
Commond Manufacturing Co. Ltd.	KCVIII
Kenwood Manufacturing Co. Ltd	citi
Kenyon William, & Sons (MetaMica), Ltd.	xxvii
acrinoid Products, Ltd x	xxvii
	xviii
	lxxii
	xxxi
immer and Trinidad Lake Asphalte Co. Ltd.	XXV
to the second of	lxx
ytag, Ltd	lvi
falkin Tiles (Burslem), Ltd., The	XXIX
IcKechnie Bros., Ltd.	cxvi
forris Rubber Industries, Ltd	
	CXVI
lational Coal Board cvi,	cxvi

				PAG
Natural Asphalte M	ine-Owners	Sc.	Manu-	
facturers' Council	*	411		lxxv
Newalls Insulation Co.	Ltd			CVI
Newman, Wm., & Sor Newsum, H., Sons & C	is, Ltd.			Xi
Newsum, H., Sons &	Lo. Ltd.			CXX
Newton Chambers & C	o. Ltd.		114	XX, XX
Parker-Knoll, Ltd.				exi
Parnall, George, & Co.				Ii
	*** ***			ci
Perring, John				xli
Pilkington Bros., Ltd.			iv, v,	xciv, xc
Powell Duffryn Modul	air, Ltd.			Xi
Quicktho Engineering,	Ltd			CXX
n				
Race, Ernest Ramsay & Sons (Forfa				CXX
Ramsay & Sons (Forta	ir), Ltd.			CXVI
Rawlplug Co. Ltd., Th				XXX
Redpath Brown, Ltd.	200			,
Reyrolle, A., & Co. Lt	d	***		X
Richards Tiles, Ltd. Riley (I.C.) Products,		***		XXXVI
Riley (I.C.) Products,	Ltd.	211		XVI
R.I.W. Protective Pro-	ducts Co. L	td.		CXXI
Roneo, Ltd		X-4-0	9.64	vili, i
Sankey Sheldon, Ltd.				li
		177		Ixv
		444		lxi
Shanks & Co. Ltd.				i
Sieber, James, Equipm	ent Co. Ltd	1		CXX
				CXXI
Stainless Steel Sinks Co	o. Ltd.			CXXX
Steel Radiators, Ltd.				XV
Still, W. M., & Sons, L	.td			1xi
Teleflex Products, Ltd.				
				C
Troughton & Young (I	ighting) I	4	411	CXI
Tuke & Bell, Ltd.	igning), L			lvii
Tunnel Portland Cemer	of Co Tid	* 6.0	44+	CXVII
Admer Portiand Cemer	at Co. Ltd.	100		XXXV
U.A.M. Plastics, Ltd		***	300	lx
Vaughan Crane Co. Ltd	1	***	***	cxvi
Vetrona Fabrics, Ltd				Ixx
Victor Products (Walls	end), Ltd.			CXXI
Wall Paper Manufactur	ers, Ltd.			lxvi
Wandsworth Electrica		urm	g Co.	
Ltd				XI
Weatherfoil Heating Sy			3.44	X
Westland Engineers, Li		212	225	CXXII
West's Piling & Constr			*11	lxxvii
Williams, John, of Care	un, Ltd.	***	***	XV
Williams & Williams, I	tG	***		iii, xxxii
	td			EXIN
Williamson, T. & R., L. Wright Anderson & Co.	T + 3			XXX

Playgrounds and Recreation **Spaces**

Introduction by Alfred Ledermann and Alfred Trächsel. Translated by **Ernst Priefert** 83" by 114". 176 pages with 302 halftones and 83 line illustrations. 63s. 0d. postage 2s. 0d.

just published

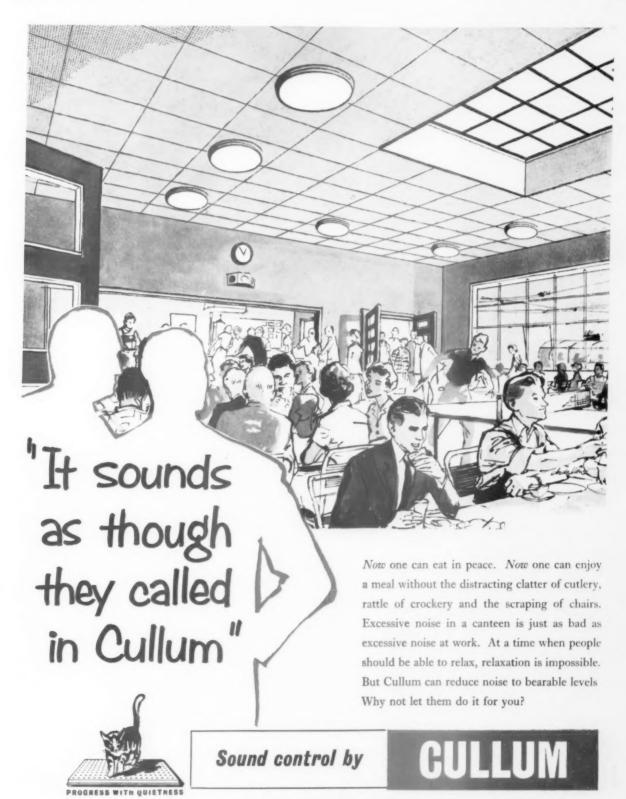


It is now recognised by planners and local authorities that imaginativelydesigned children's playgrounds and adult recreation spaces should be regarded as an essential amenity for all urban areas of any size, whether new or old; but so far very few really successful examples have appeared in the British Isles, and children in towns and cities continue, at their peril, to play their games in streets

and on roads. On the Continent, in Scandinavia and in the U.S. however, the subject is being tackled with the seriousness and care that it deserves, and there are many interesting and successful solutions to be seen.

This book, after short introductory essays written by two of Europe's leading playground designers, consists of photographs and plans of a great variety of interesting ex-

amples taken from many countries. Each scheme is accompanied by a short explanatory text, together with constructional details. The examples shown range from the smallest and most inexpensive to large schemes covering many acres, and they contain a wide variety of ingenious ideas, constructions and equipment for play and recreation.



BRITAIN'S MOST EXPERIENCED ACOUSTIC ENGINEERS

CONCESSIONNAIRES FOR ACOUSTI-CELOTEX AND BURGESS ACOUSTIC TILES

HORACE W. CULLUM & CO. LTD . The Acoustic Centre . 58 Highgate West Hill . London N.6 . FITzroy 1221 (P.B.X.)

Reinforced
Concrete
for freedom
in design

BRG

Specialists in Reinforced Concrete Design and Suppliers of Reinforcement



THE BRITISH REINFORCED CONCRETE ENGINEERING CO. LTD., STAFFORD

London, Birmingham, Bristol, Leeds, Leicester, Liverpool, Manchester, Newcastle, Cardiff, Glasgow, Dublin, Belfast, Bulawayo,
Colcutta, Johannesburg, Singapore, Vancouver.

Export Sales: 54 Grosvenor Street, London W.I

